Panasonic

S-VHS-C Movie Camera

NV-S77A

Operating Instructions

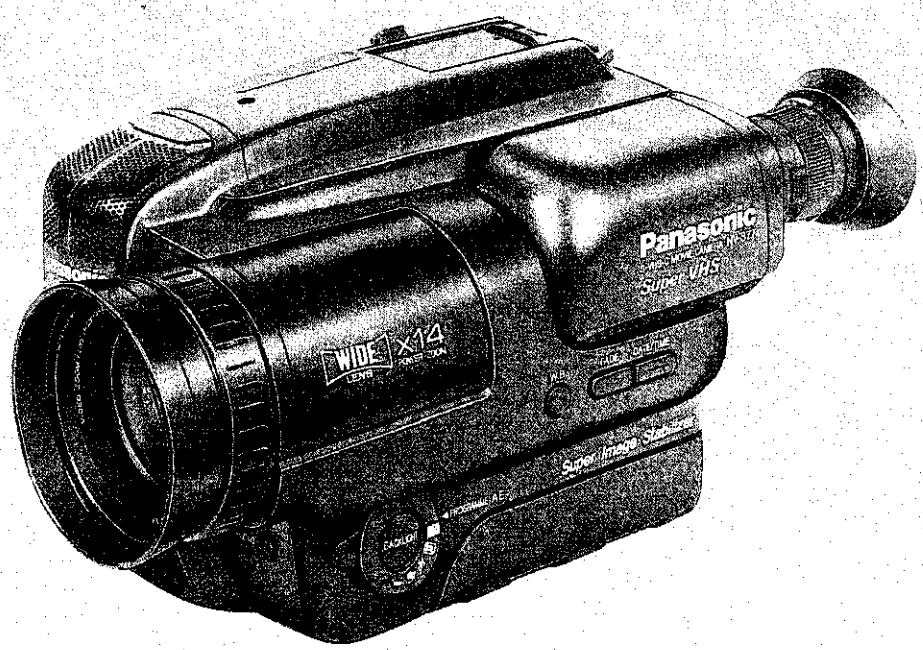
Basic Operations 3~

Advanced Operations 28~

Options/ Editing 47~

Miscellaneous/ Care of Unit 52~

Index 58~



S-VHS-C 625 VHS PAL

Hi-Fi STEREO

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT6067

Dear Customer, We would like to take this opportunity to thank you for purchasing this Panasonic Movie Camera.
Please read these Operating Instructions carefully and keep them handy for future reference.
Please keep your receipt as proof of purchase for all warranty repairs.

Information for Your Safety

IMPORTANT
Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

S-VHS-C Movie
- **The rating plate is on the bottom side of the Movie Camera.**

AC Adaptor
- **The rating plate is on the bottom side of the AC Adaptor.**

FOR YOUR SAFETY

■ DO NOT REMOVE THE OUTER COVER.
To prevent electric shock, do not remove the cover. There are no user serviceable parts inside. Refer servicing to qualified service personnel.

IF THE SUPPLY CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED BY THE SPECIAL CORD.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

Contents

Basic Operations

Check List for the Standard Accessories 3
Controls and Functions 4
Using the Remote Controller 6
Using the AC Adaptor as a Power Supply Unit 8
Watching the Picture on a TV Set 8
Charging the Battery Pack 10
Attaching the Charged Battery Pack 10
Powering the Movie Camera ON/OFF 12
Inserting a Video Cassette 12
Adjusting the Viewfinder 12
Setting the Date and Time 14
Inserting and Deleting the Date and Time 14
Starting Recording 16
Making the Subject Larger or Smaller During Recording 16
Using the Tape Counter Indication 18
Using the Memory Function 18
Confirming the Remaining Tape Time 18
Quick Reference Guide to the Indications in the Viewfinder 20
Playing Back on the Viewfinder or a TV 24
Rewinding or Fast-Forwarding the Tape 24
Using the Cue, Review and Still Playback Functions During Normal Playback 24
Playing Back on a VTR, using the Supplied Cassette Adaptor 26

Advanced Operations

Recording in the Auto Focus Mode 28
Recording in the Manual Focus Mode 28
Recording with Automatic White Balance Adjustment 32
Recording with Manual White Balance Adjustment 32
Using the Menu Function 36
Super Image Stabilizer Function 36
Recording Fast-Moving Subjects 38
Making Subjects Stand out Sharply from the Background 38
Recording Dark Scenes More Brightly 38
Recording Backlit Scenes 40
Fading In the Picture and Sound 40
Fading Out the Picture and Sound 40
Checking the End of a Recorded Scene 42
Locating a Point Where You Wish to Add a New Scene 42
Eliminating Picture Distortions by Adjusting the Tracking 42
Using the Power Save Functions 44
Lighting 46
Standard Values of Brightness 46

Options/Editing

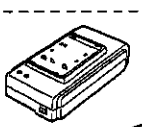
Using the Car Battery Cord (Optional) 47
Editing a Previously Recorded Tape 48
Optional Accessories 50

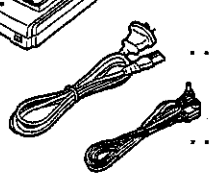
Miscellaneous/Care of Unit

Adjusting the Length of the Grip Belt 52
Attaching the Shoulder Strap 52
Storage 52
Cleaning the Viewfinder 53
Preventing Accidental Erasure of Recordings 53
Before Requesting Service 54
Cautions 56
Condensation 57
Index 58
Specifications ..... Back Cover

Check List for the Standard Accessories

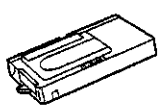
AC Adaptor Set


.....AC Adaptor


.....Mains Cable

.....DC Input Cable

.....Battery Pack


.....Cassette Adaptor

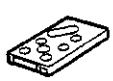
.....Battery (R6)

.....Audio/Video Cable

.....S-Video Cable

.....Shoulder Strap

.....Button-Type Battery

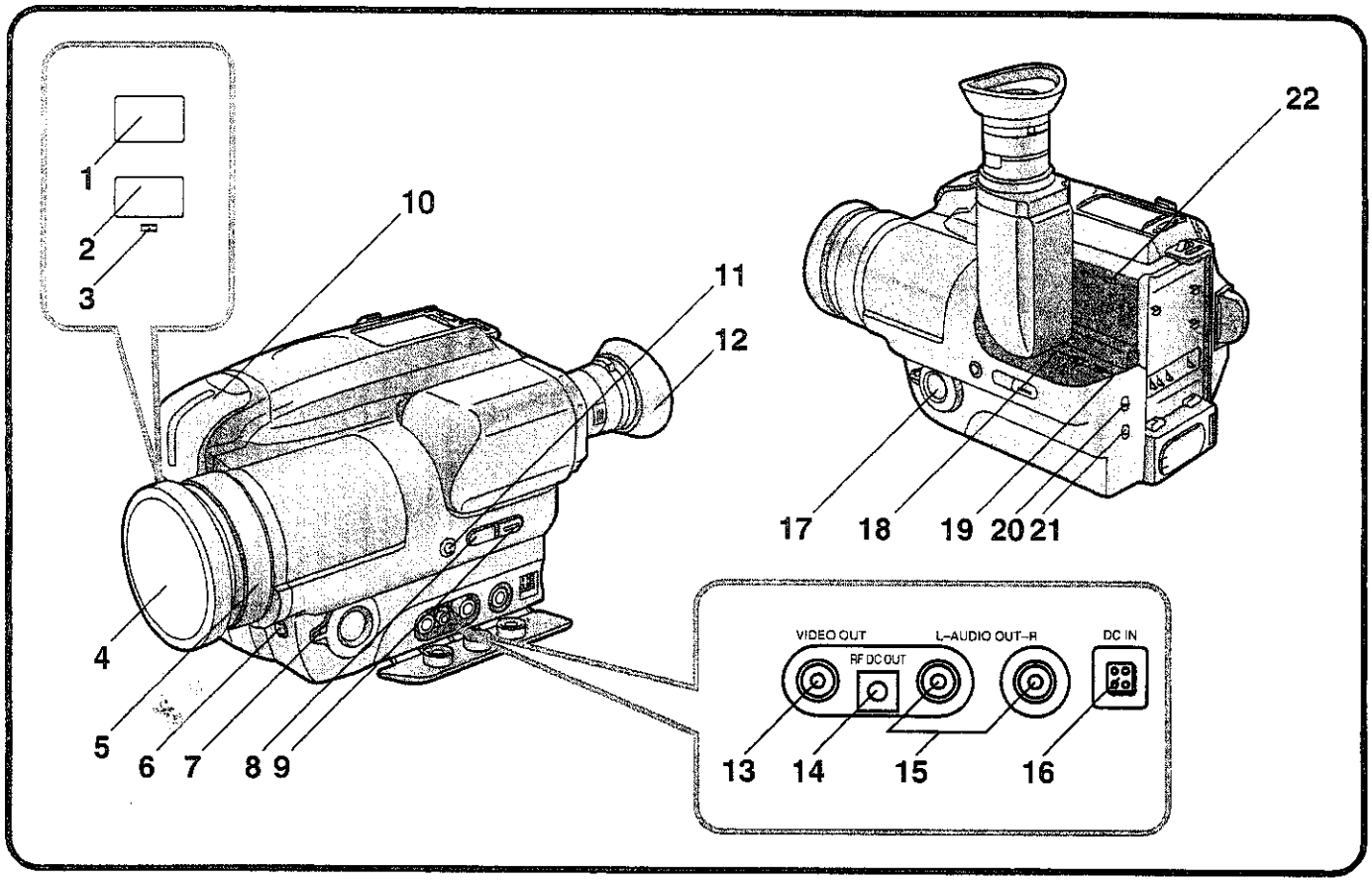

.....Remote Controller

.....Remote Controller Holder

- When purchasing an additional AC Adaptor, order model number VW-AS4E.
- For Purchasing additional Battery Packs, see the list of optional accessories on p. 50.

Controls and Functions

For more details, see the pages indicated in brackets.



1 **White Balance Sensor (p. 32)**

2 **Remote Control Receiver Window (p. 7)**

3 **Recording Indicating Lamp**
This Lamp lights during recording.

4 **Lens Cap (p. 12, 32, 52)**

5 **Focus Ring (p. 29)**

6 **[FOCUS] Button (p. 28)**

7 **[AE] Selector (p. 17, 28, 32, 39)**
Use this selector to select the desired AE mode.

8 **[FADE] Button (p. 40)**

9 **[DATE/TIME] Button (p. 14)**

10 **Microphone**

11 **[W.B] Button (p. 33)**
Manual White Balance Button

12 **Eyecup (p. 53)**

13 **[VIDEO OUT] Socket (p. 8, 48)**

14 **[RF DC OUT] Socket**
To playback via a TV Set without AV Input Socket, connect this Socket to the RF IN Socket of the TV Set using an RF Adaptor (optional).

15 **[AUDIO OUT L/R] Sockets (p. 8, 48)**

16 **[DC IN] Socket (p. 8, 47)**

17 **[BACKLIGHT] Button (p. 40)**

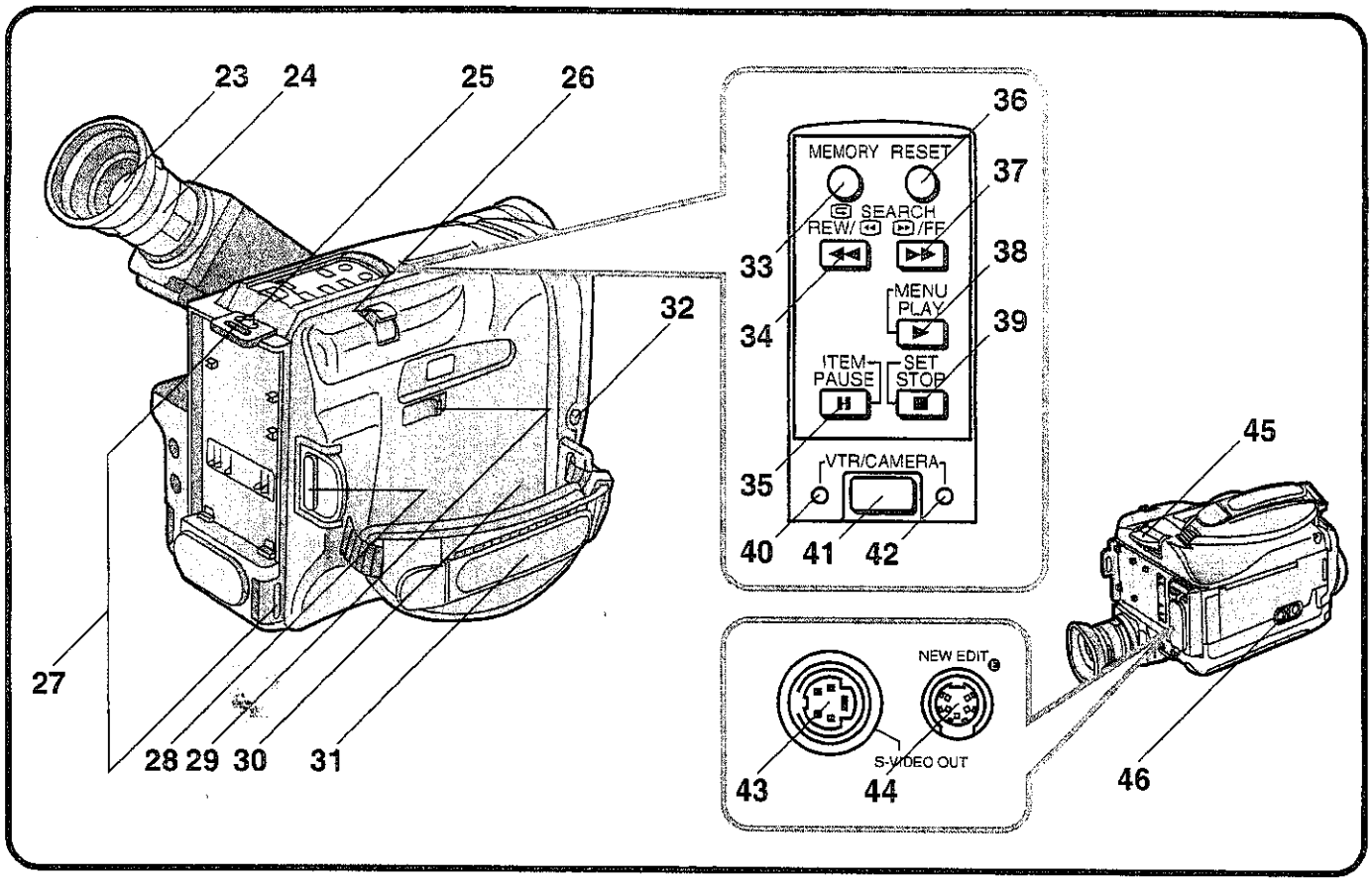
18 **[DATE/TIME/SHIFT • ◄ TRACKING] Button (p. 14, 43)**
Press this button to adjust the tracking in order to eliminate distortions in the playback picture (p. 43), or press it to advance to the next item during the setting of the date and time (p. 14).

19 **[DATE/TIME/SET • TRACKING ►] Button (p. 14, 43)**
Press this button to adjust the tracking in order to eliminate distortions in the playback picture (p. 43), or press it to set the correct date and time (p. 14).

20 **[POWER SAVE] Switch (p. 44)**
Setting this switch to "ON" activates the Power Save Function.

21 **[IMAGE STABILIZER] Switch (p. 37)**

22 **Dew Sensor Slot**
Through this slot, the Movie Camera detects condensation. Take care not to let this slot gets clogged with dirt and not to cover it with your fingers, etc.



23 Viewfinder (p. 20)

24 Eyepiece Corrector Ring (p. 13)

25 [BATTERY EJECT] Lever (p. 11)

26 [W • T] Zoom Lever (p. 17)

27 Shoulder Strap Holders (p. 52)

28 Recording Start/Stop Button (Red) (p. 17)

29 [EJECT ⏏] Lever (p. 12)

30 Cassette Compartment Cover (p. 13)

31 Grip Belt (p. 52)

32 [MIC] Socket
To record sound with an external microphone, connect it to the [MIC] Socket. (Connecting an external microphone automatically disconnects the built-in microphone.) Ensure that the microphone conforms with the following requirements:
- Connection Cable; M3-type plug
- Impedance; less than 4.7 kohm
- Type; Stereo-type
  (If a mono-type microphone is connected, no sound will be recorded on the right channel.)
- Sensitivity; Approx. −70 dB
- Microphone Power Source; A type that does not require a power source

33 [MEMORY] Button (p. 18)

34 [REW/ ◀◀] Button (p. 24, 42)
Use this Button for:
- Recording Review
- Review
- REW (Rewind)
- Camera Search

35 [ITEM/PAUSE] Button (p. 25, 37)

36 [RESET] Button (p. 18)

37 [▶▶ /FF] Button (p. 24, 43)
Use this Button for:
- Cue
- FF (Fast-Forwarding)
- Camera Search

38 [MENU/PLAY] Button (p. 25, 37)

39 [SET/STOP] Button (p. 25, 37)

40 "VTR" Indication Lamp (p. 24)

41 [VTR/CAMERA] Button (p. 24)
Press this Button to select the "VTR" Mode for playback or the "CAMERA" Mode for recording.

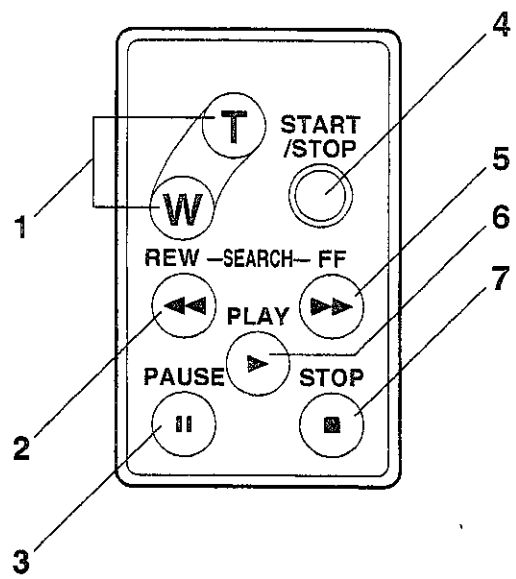
42 "CAMERA" Indication Lamp (p. 16)

43 [S-VIDEO OUT] Socket (p. 9, 48)

44 [NEW EDIT] Socket (p. 49)

45 [POWER] ON/OFF Switch (p. 12)

46 Tripod Receptacle
Attach a Tripod (optional) to this Receptacle.



■ Controls and Functions

1 **[W • T] Zoom Buttons (p. 17)**

2 **[REW] Button (p. 25, 43)**
Use this Button for:
- Recording Review
- Review
- REW (Rewind)
- Camera Search

3 **[PAUSE] Button (p. 25)**

4 **Recording Start/Stop Button (p. 17)**

5 **[FF] Button (p. 25, 43)**
Use this Button for:
- Cue
- FF (Fast-Forwarding)
- Camera Search

6 **[PLAY] Button (p. 25)**

7 **[STOP] Button (p. 25)**

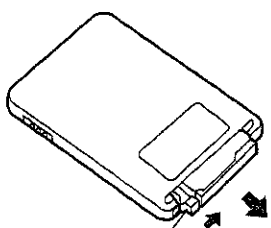
■ How to Insert the Button-Type Battery

1 **Pull out the Battery Holder while pushing the stopper.**

2 **Turn the Battery Holder upside down and insert the Battery with the (+) mark facing downward until it locks with a click.**

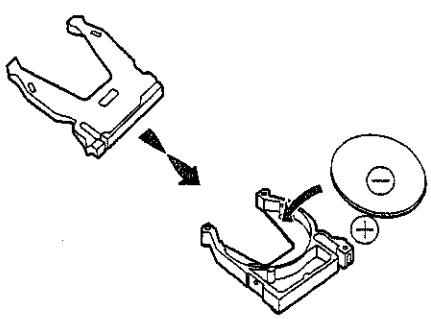
3 **Insert the Battery Holder into the Remote Controller.**

1



Stopper

2



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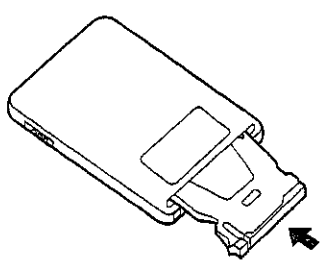
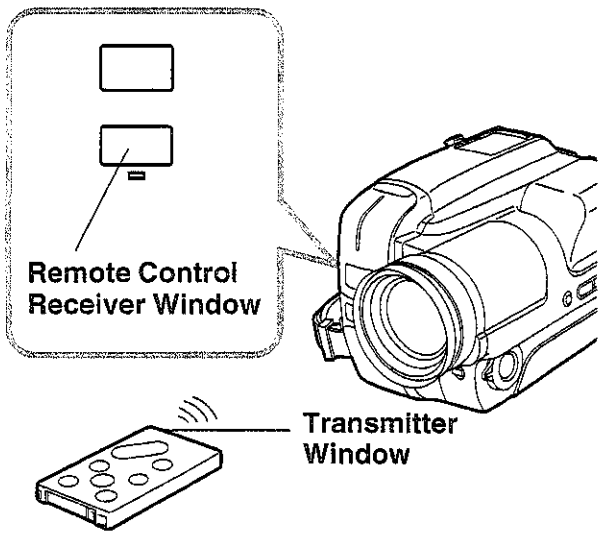


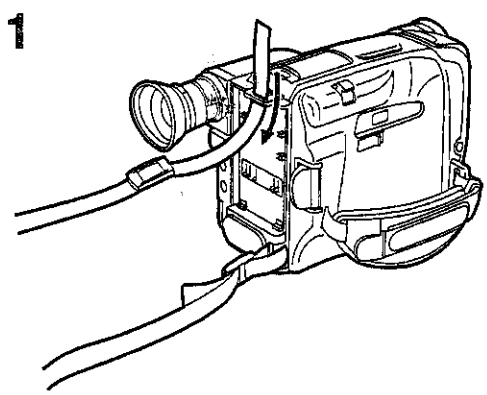
■ Replacing the Button-Type Battery

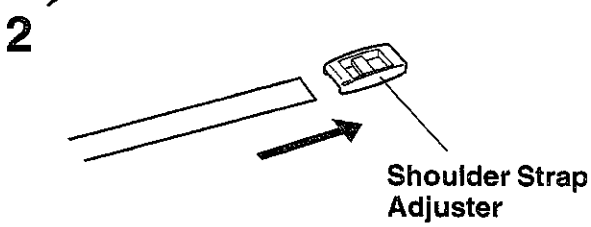
The life of the battery is about one year.
Replace the exhausted battery with a new CR2025 Battery.

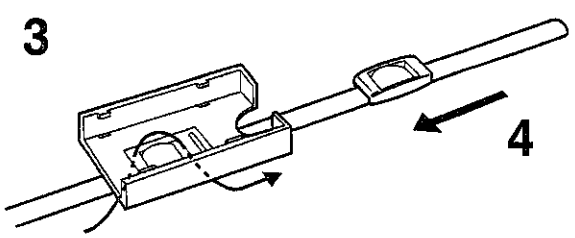
Information for your safety

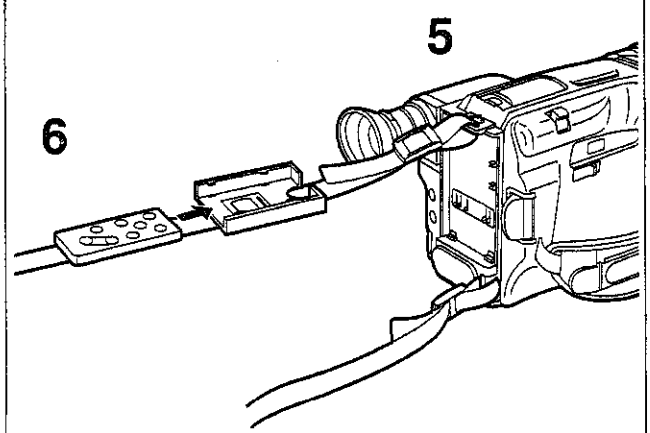
WARNING
"THE LITHIUM BATTERY" IS A CRITICAL COMPONENT (TYPE NUMBER CR2025 MANUFACTURED BY PANASONIC).
IT MUST NEVER BE SUBJECTED TO EXCESSIVE HEAT OR DISCHARGE. IT MUST THEREFORE ONLY BE FITTED IN EQUIPMENT DESIGNED SPECIFICALLY FOR ITS USE.
REPLACEMENT BATTERIES MUST BE OF THE SAME TYPE AND MANUFACTURER.
THEY MUST BE FITTED IN THE SAME MANNER AND LOCATION AS THE ORIGINAL BATTERY, WITH THE CORRECT POLARITY CONNECTIONS OBSERVED.
DO NOT ATTEMPT TO RE-CHARGE THE OLD BATTERY OR RE-USE IT FOR ANY OTHER PURPOSE IT SHOULD BE DISPOSED OF IN WASTE PRODUCTS DESTINED FOR BURIAL RATHER THAN INCINERATION".











When you want to take part in the action that you are recording, simply place the Movie Camera on a tripod and then start and pause recording as well as operate the zoom and other functions by pressing a button on the Remote Controller (supplied). Aim it at the Remote Control Receiver Window on the front of the Movie Camera and press the corresponding Button.

Notes:

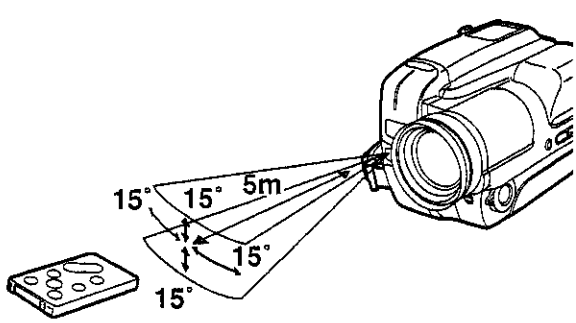
- Do not cover the Transmitter Window on the Remote Controller with your hand, etc.
- The Remote Controller may not operate correctly if it is used in direct sunlight, near fluorescent lamps or too close to the Movie Camera.
- When using the Remote Controller outdoors, operating range may become shorter than 5 metres.

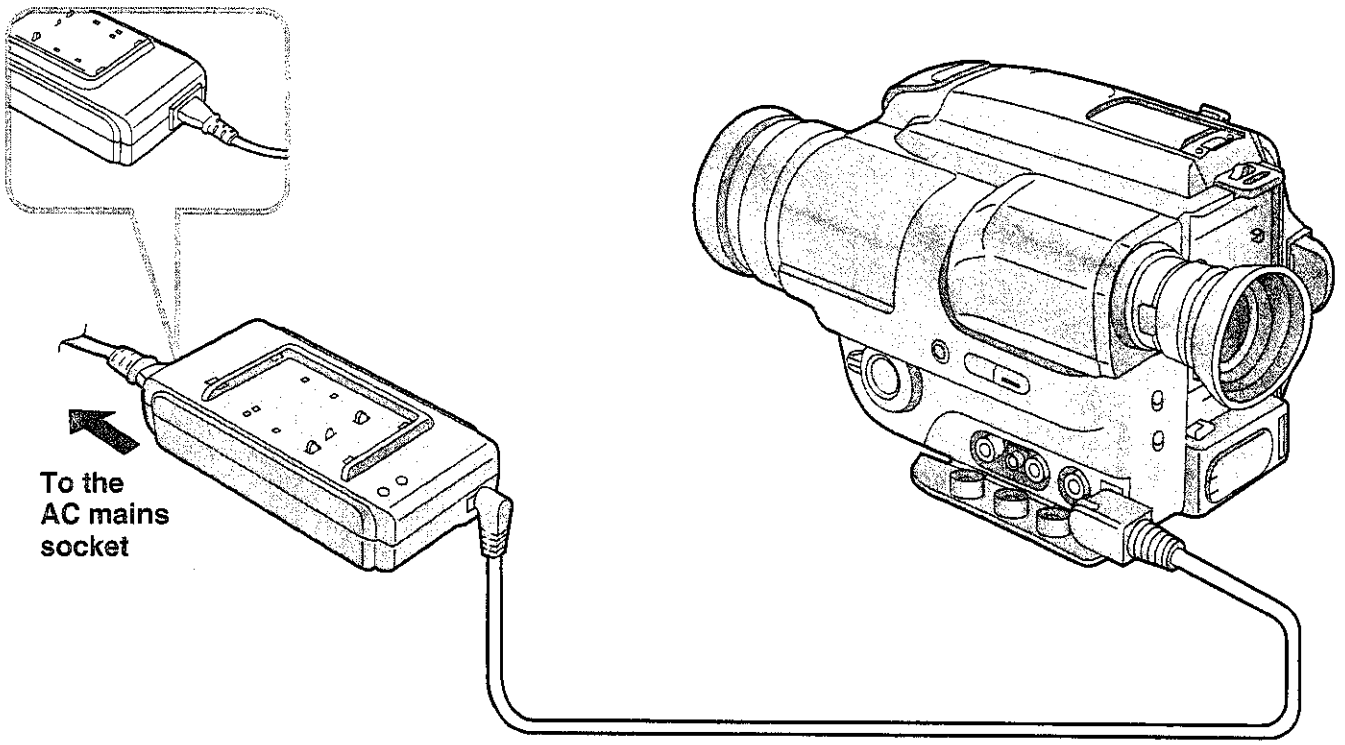
■ Using the Remote Controller Holder

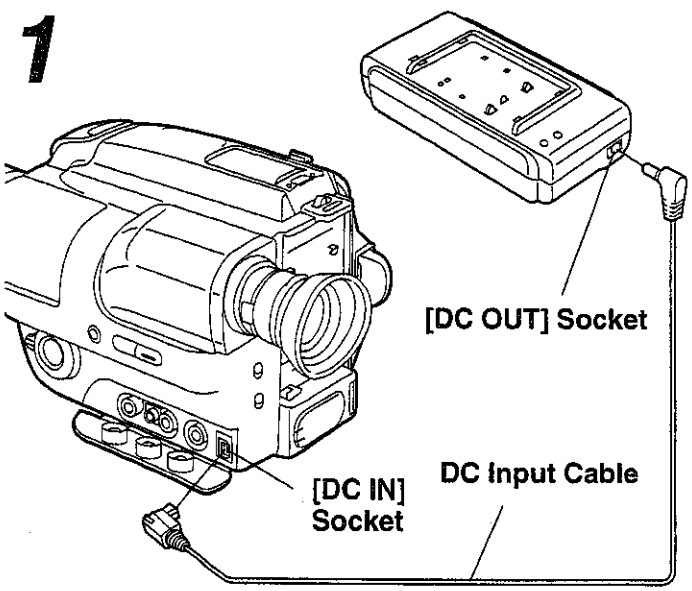
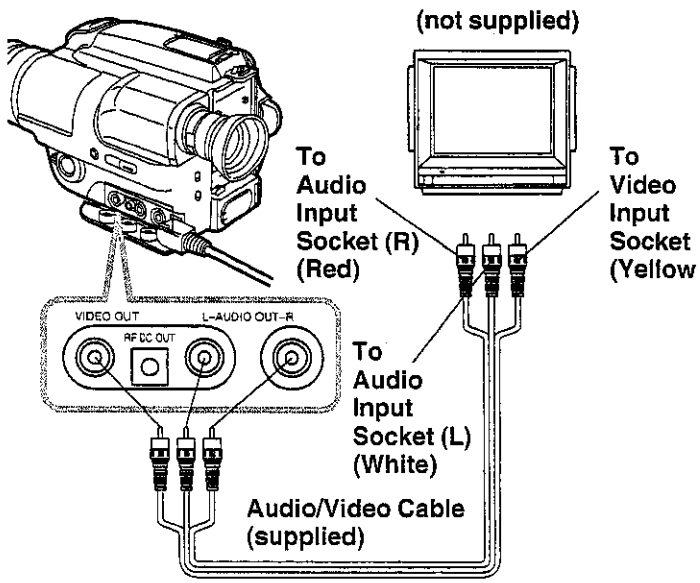
(To keep the Remote Controller handy when you go out recording)

1. **Remove one end of the Shoulder Strap from the Movie Camera.**
2. **Remove the Shoulder Strap Adjuster.**
3. **Pull the Shoulder Strap in the direction of the arrow through the two slits on the back of the Remote Controller Holder.**
4. **Re-attach the Shoulder Strap Adjuster.**
5. **Re-attach the Shoulder Strap to the Movie Camera.**
   (See "Attaching the Shoulder Strap" on page 52.)
6. **Insert the Remote Controller securely into the Holder.**

■ Operating Range for the Remote Controller





Title	Procedure
Using the AC Adaptor as a Power Supply Unit If you want to use the Movie Camera with the Battery Pack, it is necessary to charge the Battery Pack first. (p. 10)	**1** 
Watching the Picture on a TV Set (Using the Audio/Video Cable or S-Video Cable) Connect after turning off the Movie Camera and the TV Set.	 **Connect the Movie Camera to the TV set.**

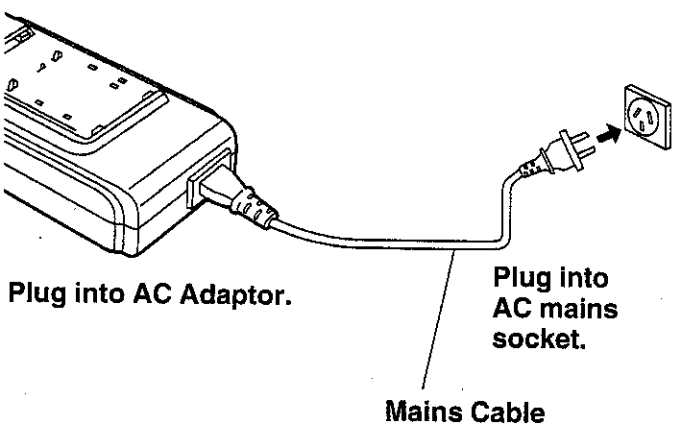
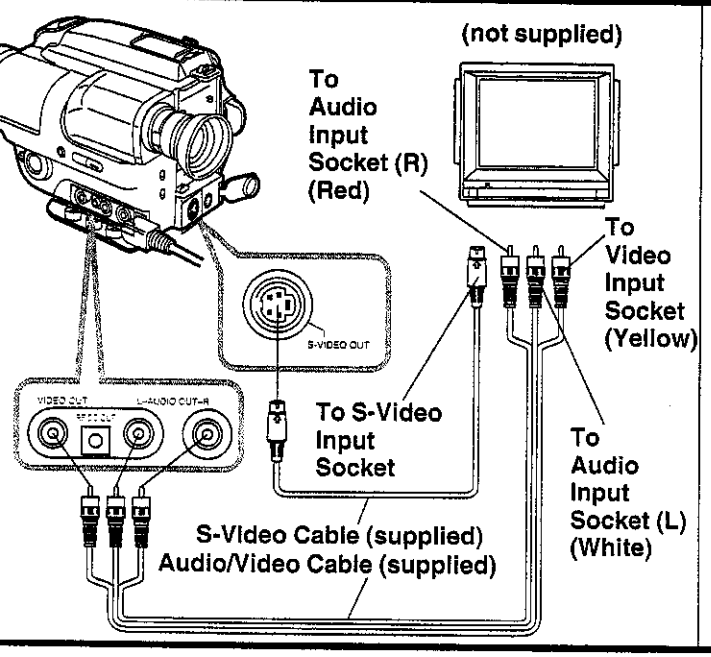
Cautions for the AC Adaptor

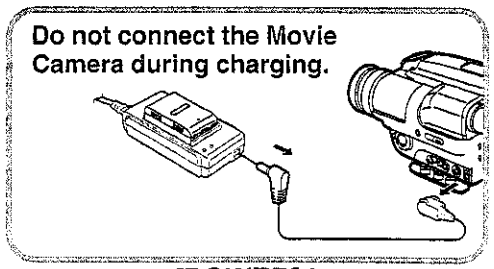
■ Cautions for Use

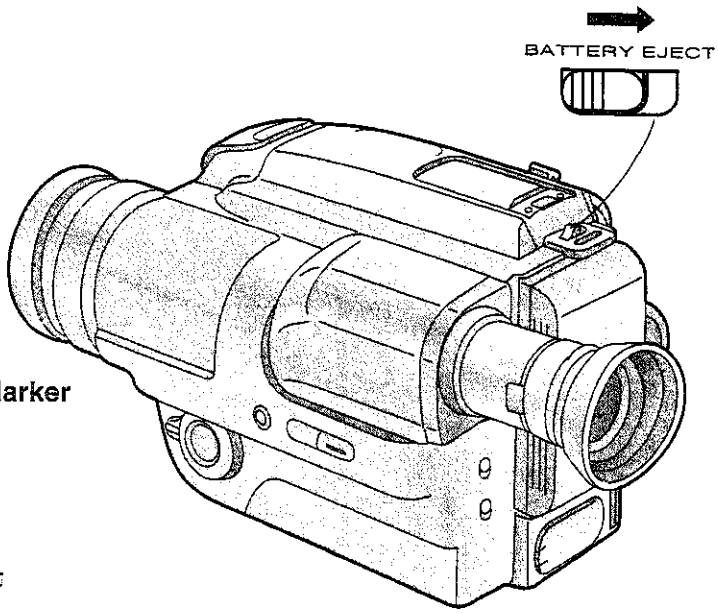
- This AC Adaptor works on any mains supply voltage between 100 and 240 V, and any frequency between 50 and 60 Hz. For use in other countries, an adaptor plug may be necessary.
- Do not handle the AC Adaptor with wet hands.

■ Caution for Cleaning

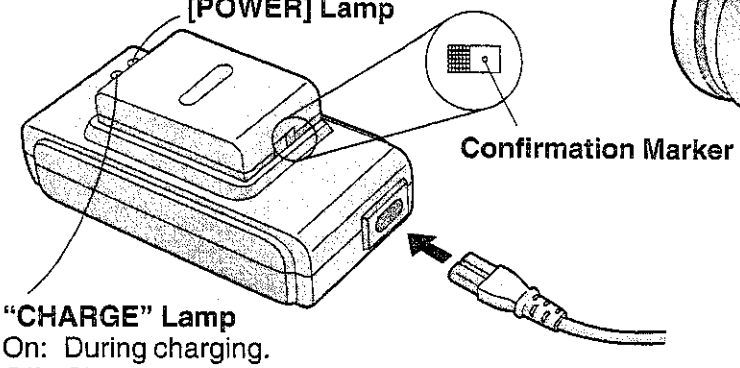
Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.

	Remarks, etc.
2  	• When the AC Adaptor is used to supply the Movie Camera with power, remove the Battery Pack from the AC Adaptor as it cannot charge the Battery Pack and provide power simultaneously. • Do not use the AC adaptor for any purposes other than supplying the unit with power or charging the Battery Pack. • When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio further away from the AC Adaptor or move the adaptor away from the radio. • When not using the AC Adaptor, unplug its mains cable from the AC mains socket. To unplug, pull it by the plug, not by the cable.
 	• If your TV set is not equipped with an AV Input Socket, the RF Adaptor (optional) is necessary. For its connection, read the operating instructions of the RF Adaptor (VW-RF7E).

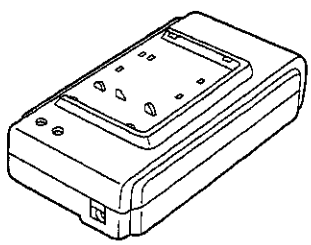
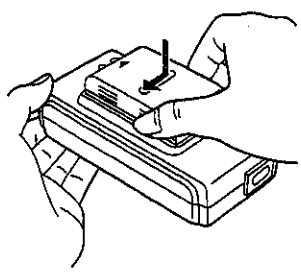
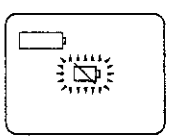
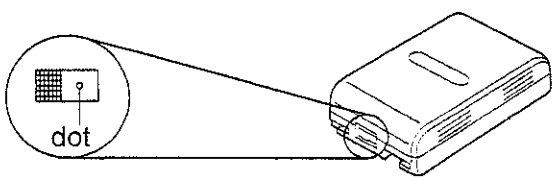
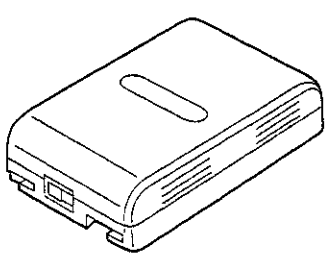
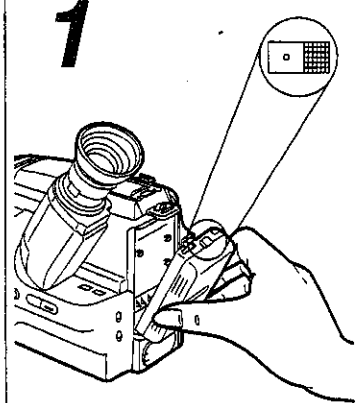




[POWER] Lamp

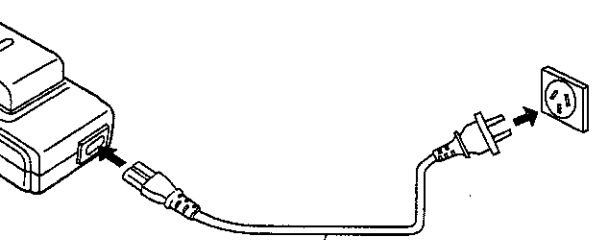


"CHARGE" Lamp
On: During charging.
Off: Charging is finished.
(For maximum charge, continue charging for 2 hours after the "CHARGE" Lamp has gone off.)

Title	*Procedure*	
Charging the Battery Pack		***1***
●Be sure to insert the mains plug completely into the correct socket. ●Do not connect the DC Input Cable to the AC Adaptor otherwise the Battery Pack cannot be charged. ●Ni-MH (Nickel-Metal-Hydride) Battery Packs (VW-VBH10E and VW-VBH20E) may not perform very well in cold conditions (e.g. the snow). ●Never remove the Battery Pack during recording or playback, because the tape would remain in contact with the video heads and this could cause damage to the heads and tape.		 **Attach the Battery Pack.**
Attaching the Charged Battery Pack		***1***
 If an exhausted Battery Pack is attached, the " " Indication in the Viewfinder flashes, when you turn the Movie Camera on. **Charging Confirmation Marker** Use this marker to distinguish between charged and discharged Battery Packs. For example, slide the Button so that the dot is visible after charging is completed. 		 **Attach the Battery Pack with its Charge Confirmation Marker facing upward.**

- If you want to improve the charge of a Battery Pack whose operation time has become too short for practical use or which has been stored for a long time, continue charging for 24 hours even after the "CHARGE" Lamp on the AC Adaptor goes out. (If this does not result in an operation time close to that shown in the table, the service life of this Battery Pack has reached its end. Replace it with a new one.)
- To prevent leakage, excessive rise in temperature and explosion, be sure to observe the following points:
  1) Use only the specified AC Adaptor or Car Battery Charger to charge the Battery Pack.
  2) Make sure that no metal objects touch the connectors of the Battery Pack.
     - Do not charge the Battery Pack again when it is already fully charged.
     - During recording or charging, the Battery Pack may become warm. This is normal, not a malfunction.
     - Do not leave the Battery Pack in the Movie Camera while it is in storage.
  3) Do not heat the Battery Pack or throw it into a fire.
  4) Do not apply solder to the Battery Pack and do not disassemble or reconstruct it.

2



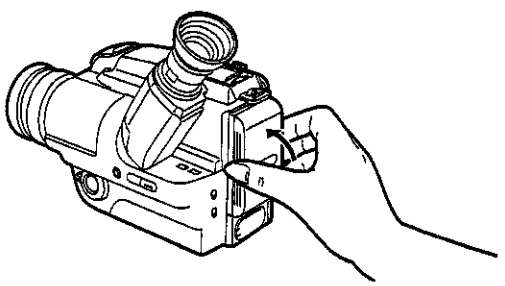
Plug into Adaptor. **Plug into AC mains socket.**

Mains Cable

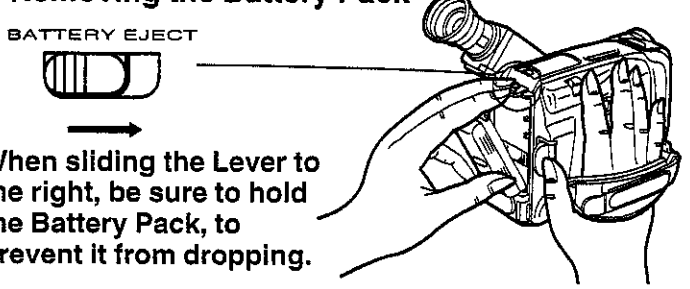
■ Removing the Battery Pack

Slide it in the opposite direction to step 1.

2



■ Removing the Battery Pack



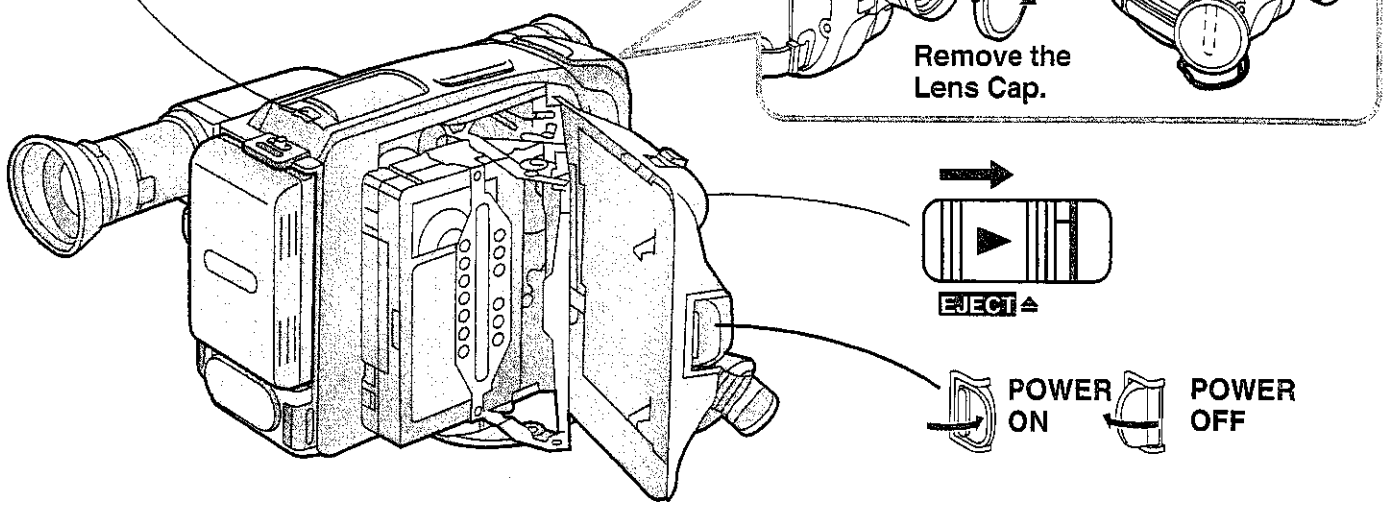
When sliding the Lever to the right, be sure to hold the Battery Pack, to prevent it from dropping.

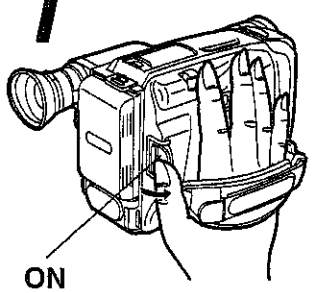
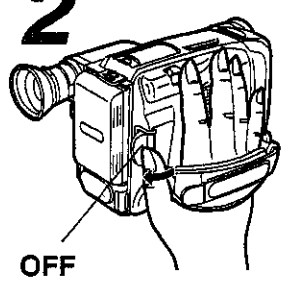
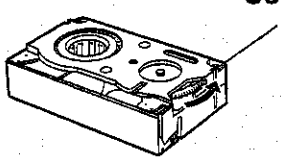
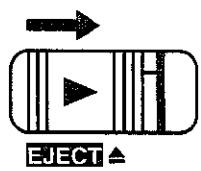
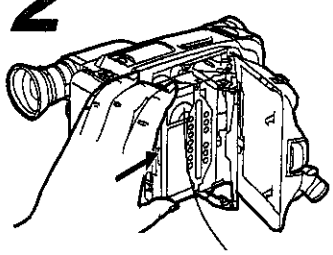
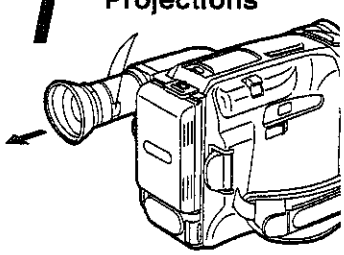
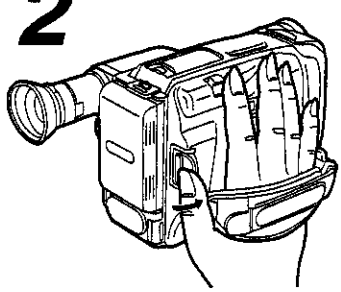
Remarks, etc.

Battery Pack No.	Charging Time	Max. Continuous Filming Time
Supplied	Approx. 60 min.	Approx. 35 min.
VW-VBS10E	Approx. 65 min.	Approx. 40 min.
VW-VBS20E	Approx. 130 min.	Approx. 80 min.
VW-VBH10E	Approx. 80 min.	Approx. 50 min.
VW-VBH20E	Approx. 160 min.	Approx. 100 min.

- Depending on the condition of the Battery Pack, the charging time may be longer than listed above.
- The Battery Pack must be discharged in the Movie Camera so that the " " Indication starts to flash indicating an exhausted Battery Pack. Do not charge the Battery Pack if it is not discharged, because to do so would shorten the recording time that it can provide.
- The figures in the table above are based on an ambient temperature of 25°C.
- The use of the zoom and other functions increase the power consumption, so that the actual recording time per Battery Pack is 30%–50% less than for continuous recording.
- Charge the Battery Pack at a room temperature between 10° and 35°C.
  The Battery Pack's ability to generate electric energy is based on a chemical reaction. Because this reaction can take place better at high temperature, the maximum recording time may be considerably shorter when recording at low temperature.
- If the Movie Camera has turned off automatically because the Battery Pack has become exhausted, remove the Battery Pack before connecting the DC Input Cable of the AC Adaptor to the Movie Camera to continue recording, otherwise the Movie Camera cannot be turned on.

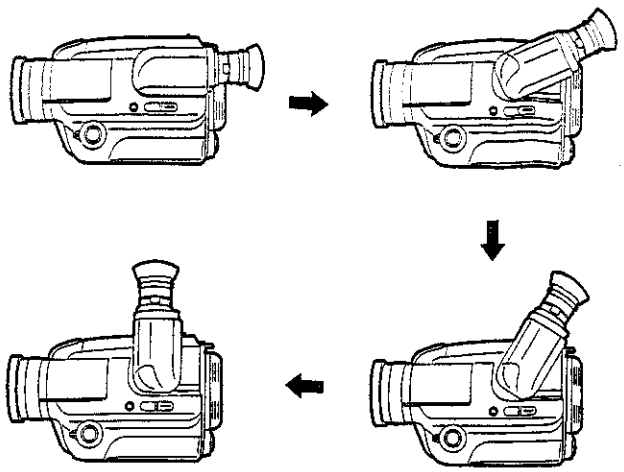
When you turn out the [POWER] ON/OFF Switch, the "CAMERA" Indication Lamp lights.

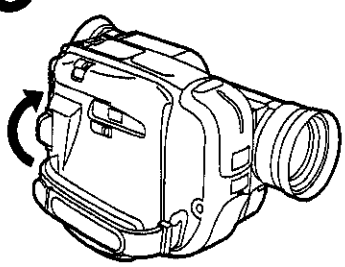
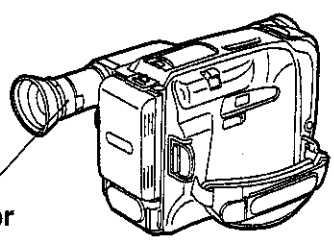


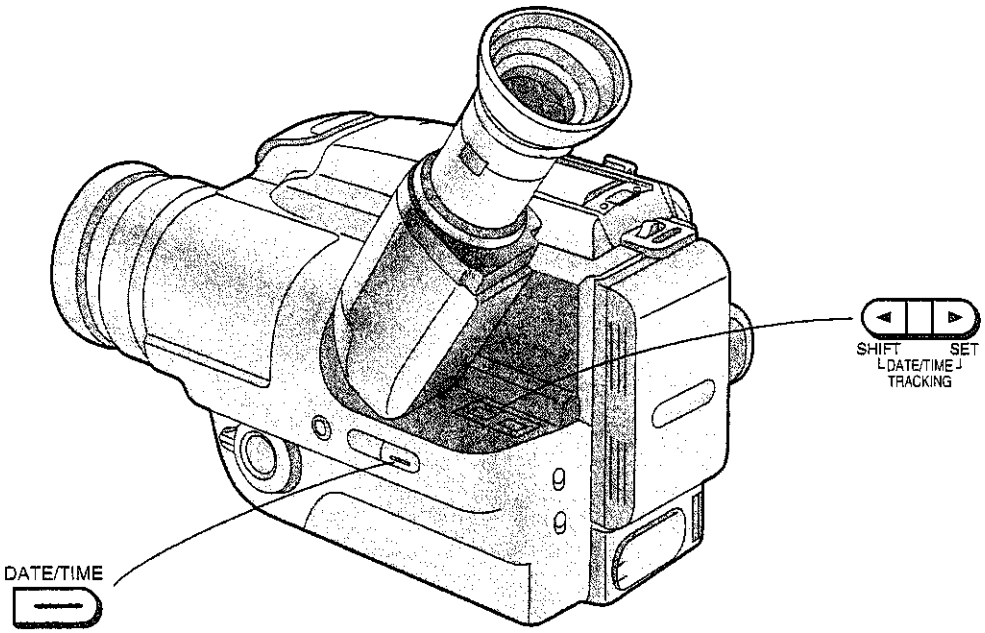
Title	Procedure	
Powering the Movie Camera ON/OFF	**1**  ON **Turn the [POWER] ON/OFF Switch out.**	**2**  OFF **Turn the [POWER] ON/OFF Switch in.**
Inserting a Video Cassette Before inserting the Video Cassette, make sure that the tape is tight. If it is loose, turn the cog wheel in the direction of the arrow to tighten it. **Cog Wheel** 	**1**  **Slide the [EJECT ⏏] Lever to the right.**	**2**  **Cassette Window** **Insert the video cassette.**
Adjusting the Viewfinder Grasp the Viewfinder by the projections on both sides (see Fig. *1*) and pull it backward to its fully locked position.	**1** **Projections**  **Extend to fully locked position.**	**2**  **Turn [POWER] ON/OFF switch out.**

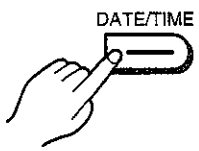
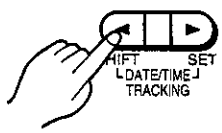
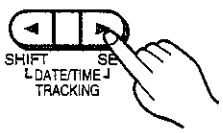
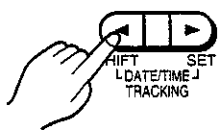
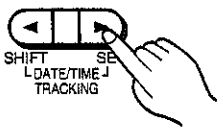
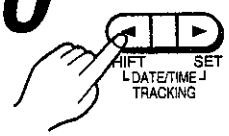
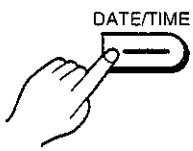
Adjusting the Angle of the Viewfinder

The tilting range of the Viewfinder is 90°
(4 positions are marked by click stops).



		Remarks, etc.
		When you turn on the Movie Camera while a Video Cassette is already inside, it is automatically put in the Recording Pause Mode. (p. 17)
3  **Close.**		**■ Ejecting the Video Cassette** After you have stopped recording, slide the [EJECT ▲] Lever to the right. The Cassette Compartment Cover opens after a few seconds and you can then take out the Video Cassette. ●It is not possible to take out the Video Cassette during recording. ●Do not repeatedly insert and take out the Video Cassette. This could cause the tape to become loose and damaged.
3  **Eyepiece Corrector Ring** **Look into the Viewfinder and turn the Eyepiece Corrector Ring until the indications in the Viewfinder are clear and easy to read.**		●When extending the Viewfinder, do not grasp it by the Eyecup, because the Eyecup could become detached from the Viewfinder. ●Do not apply any pressure on the Viewfinder except when extending or retracting it. ●Be sure to retract the Viewfinder after recording.



Title	Procedure
Setting the Date and Time Before setting, attach the charged Battery Pack or connect the AC Adaptor to the Movie Camera and turn the Movie Camera on. **For example:** To set the clock to October 15, 1996, 12:30...	**1**  **Press the [DATE/ TIME] Button.** **2**  **Press until the "Year" portion flashes.** **5**  **Press to set to "10".** **6**  **Press to make the "Day" portion flash.** **9**  **Press to set to "12".** **10**  **Press to make the "Minute" portion flash.**
Inserting and Deleting the Date and Time The Date and Time Indications can be inserted and deleted during recording as well as in the Recording Pause Mode.	 To insert or delete the Date and Time (or Date only) Indication, press this button repeatedly. The indications appear and disappear in the order shown on the right.

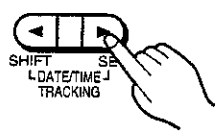
The Built-in Lithium Battery

A built-in rechargeable lithium battery inside the Movie Camera maintains the operation of the built-in clock when the Movie Camera is not in operation. Whenever the Movie Camera is in operation, it automatically recharges this battery. However, if you don't use the Movie Camera for a very long time, the lithium battery can become exhausted.
In this case, the "⊜" Indication in the Viewfinder flashes and the date returns to the initial Indication "1.1.1990".
If the "⊜" Indication in the Viewfinder flashes for approx. 10 seconds when you turn the Movie Camera on, the lithium battery is exhausted and must be charged as explained on the right.

1 Connect the Movie Camera (with power off condition) to the AC Adaptor and wait for approx. 4 hours.
- After charging the lithium battery in this way, it can maintain the operation of the clock for approx. three months.

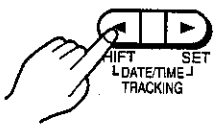
WARNING
THE LITHIUM BATTERY IN THIS UNIT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. IF THIS IS NECESSARY, CONTACT THE PANASONIC CUSTOMER CARE CENTRE ON 132600 FOR YOUR NEAREST AUTHORISED SERVICE CENTRE.

3



Press to set to "1996".

4



Press to make the "Month" portion flash.

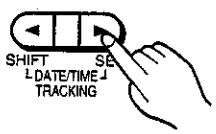
7

Press to set to "15".

8

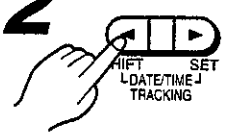
Press to make the "Hour" portion flash.

11



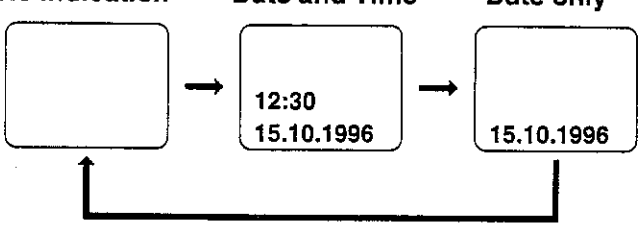
Press to set to "30".

12



Press to start the clock.

No indication **Date and Time** **Date only**



Remarks, etc.

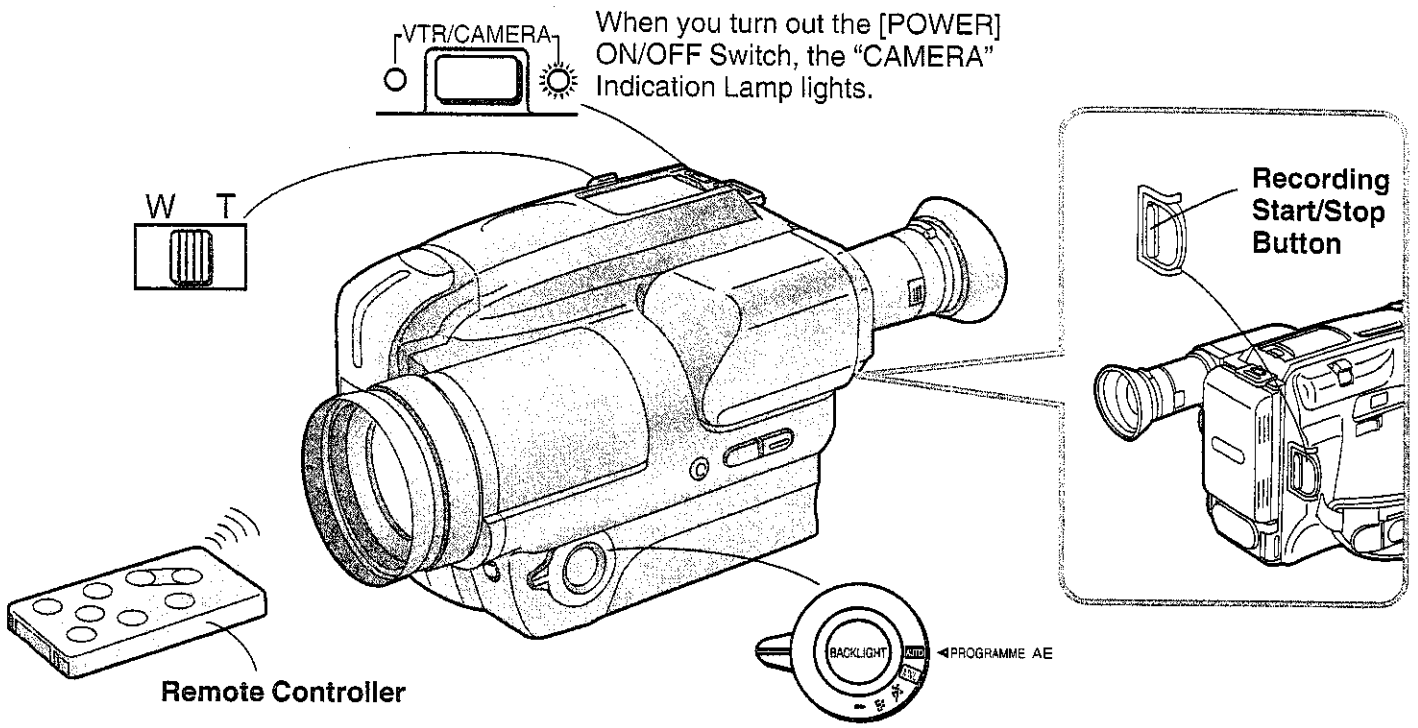
■ Changing the Figures of the Date/Time Indication

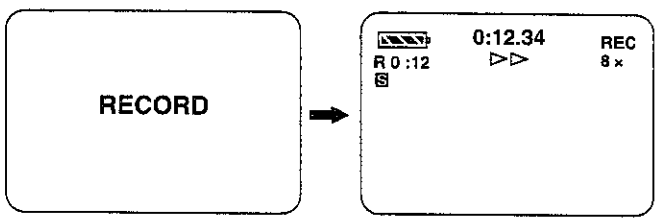
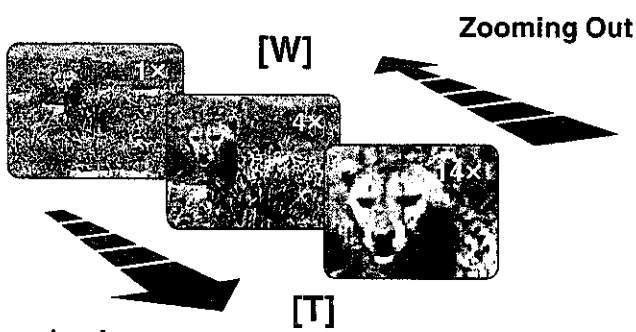
You can change the Date/Time Indication in the order shown below by pressing the [SET] Button repeatedly.

Year;	**1990**→1991→ . . . . . 2089→**1990**→...
Month;	**1**→2→ . . . . . →12→**1**→...
Day;	**1**→2→ . . . . . →31→**1**→...
Hour;	**0**→1→ . . . . . →23→**0**→...
Minute;	**00**→01→ . . . . . →59→**00**→...

- If you want to change the figures more quickly, keep the [SET] Button pressed.
- If you make a mistake during setting, start again from the beginning.

Movie Camera Set-Up complete, now ready to use.

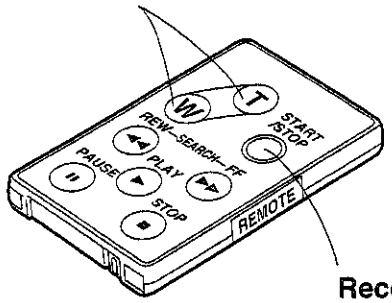


Title	Viewfinder
Starting Recording	 For the detailed explanations for each indication in the Viewfinder, see p. 20. Shown above is a typical example of the indications visible when recording in the Auto Mode.
Making the Subject Larger or Smaller During Recording (Zooming) Zooming is also possible in the Recording Pause Mode, so you can select the desired zoom setting before you start recording. • In the maximum tele setting (14×), the minimum recording distance is 1.5 m. If you want to approach the subject closer, see p. 17 "Using the Macro Close-up Function". • To prevent inadvertent operation of other infra-red remote-controlled units, this Movie Camera needs to receive each infra-red command 3 times. For this reason, there is a slight delay between pressing the [W] or [T] Button on the Remote Controller and the actual operation of the mechanical zoom function on the Movie Camera.	 **Zooming In** • The approximate selected zoom magnification is indicated in the Viewfinder. • The zoom range extends from the wide-angle setting of the lens (1×) to the tele setting (14×).

■ Remote Controller

Recording Start and Stop as well as zooming in and out can be operated with this Remote Controller.

[W • T] Zoom Buttons



Recording Start/Stop Button

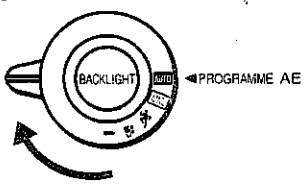
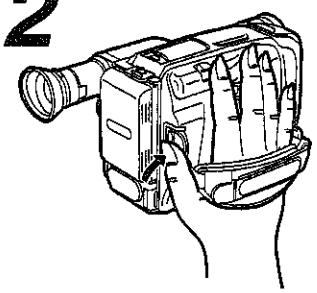
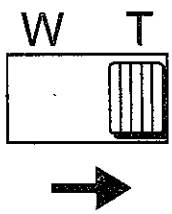
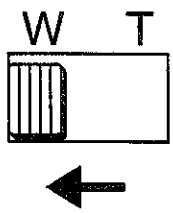
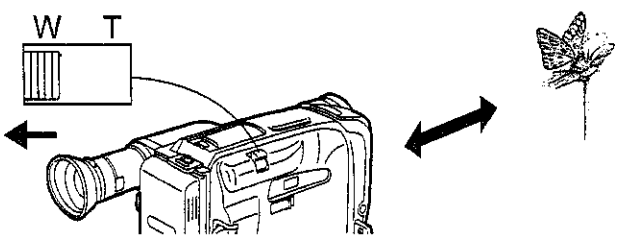
- The zooming speed can not be changed.

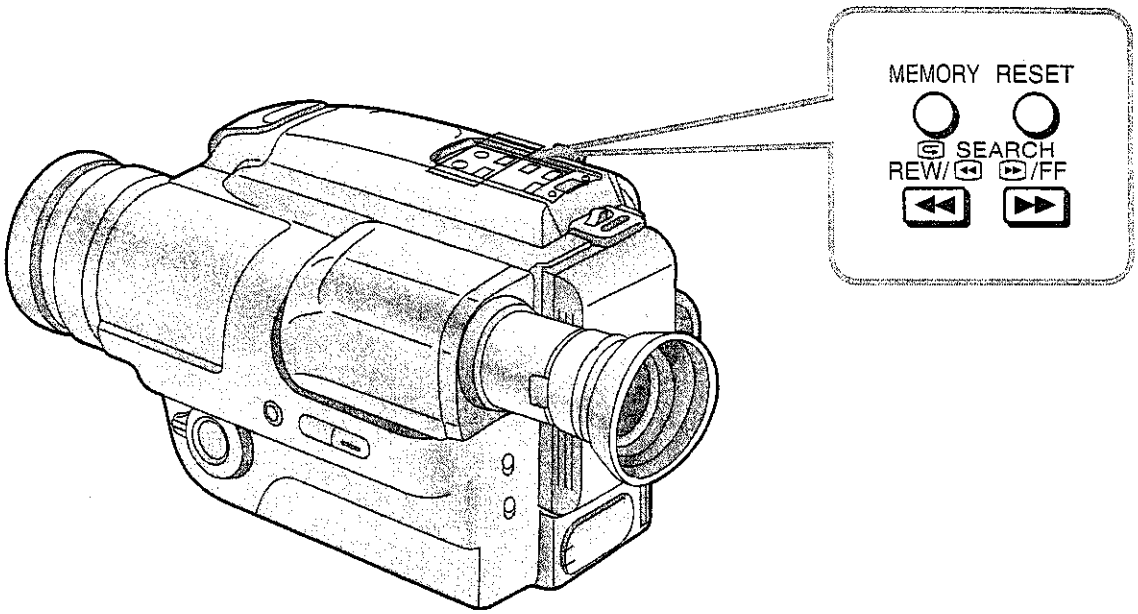
Index Signals (VISS)

Many VHS VTRs feature the Index Search and Intro Scan Functions that make it easy to locate the beginning of scenes marked with index signals. This Movie Camera automatically records an index signal in the following cases:

- When recording is started for the first time after attaching the Battery Pack.
- When recording is restarted after exchanging the cassette or after pressing the [VTR/CAMERA] Button.

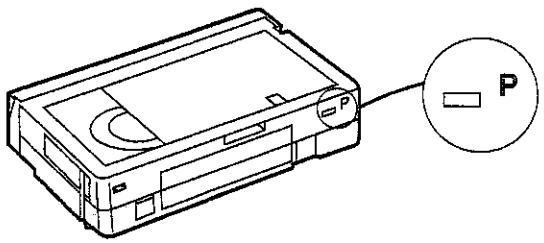
The "INDEX" Indication flashes briefly in the Viewfinder while the Movie Camera records an index signal.

Procedure	*Remarks, etc.*
1  **Confirm that the [AE] Selector is set to "AUTO".**	**■ To Stop (Pause) the Recording:** Press the Recording Start/Stop Button. The "PAUSE" Indication appears in the Viewfinder. • If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. If you want to resume recording from this condition, turn the [POWER] ON/OFF Switch in (the Movie Camera switches off) and then turn it out again.
2  **Press the Recording Start/Stop Button.**	**■ To Finish Recording:** Turn the [POWER] ON/OFF Switch in. (The Movie Camera switches off.)
1 **■ Zooming In**  **"T" means Tele.** **■ Zooming Out**  **"W" means Wide.** • The zooming speed varies depending on how far you push the [W • T] Zoom Lever towards "W" or "T". (The further you push it, the faster the zooming speed becomes.)	**■ Using the Macro Close-up Function** After keeping the [W • T] Zoom Lever pressed toward "W" to zoom to the maximum wide-angle setting, the subject can be focussed down to a minimum distance of only 5 mm between lens and subject. • As the depth of field is very small in this mode, even slight camera movements can cause the subject to go out of focus. Therefore, it is recommended to use a tripod (optional). • If you want to record pictures in a photo album or a similar situation with insufficient lighting, use a Video DC Light (optional). 



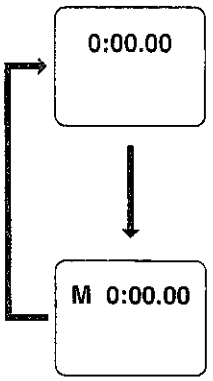
Title	Viewfinder	Procedure
Using the Tape Counter Indication The Tape Counter in the Viewfinder shows the elapsed recording or playback time in hours, minutes and seconds. To make it easy to keep track of the elapsed recording time, reset the Tape Counter to "0:00.00" by pressing the [RESET] Button.	0:00.00 Seconds Minutes Hours	**1** ■ **To Reset the Tape Counter:** RESET
Using the Memory Function The Memory Function makes it easy to locate the beginning of a desired scene or any other point during recording. To use this function, mark the desired point by following steps 1 to 3 on the right. When you then rewind or fast-forward the tape, it stops automatically at the "0:00.00" position.	M 0:00.00 Means: Memory	**1** ■ **To Make the "M" Indication Appear:** MEMORY
Confirming the Remaining Tape Time During recording or playback, the Remaining Tape Time is automatically displayed in the Viewfinder. **Note:** This function is only meant as a guide. The Remaining Tape Time Indication is subject to imprecision due to either customer error (such as incorrectly selected Tape Length) or stretching of the tape.	30 R 0:30 Means: Remaining	

Video Cassette



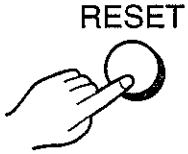
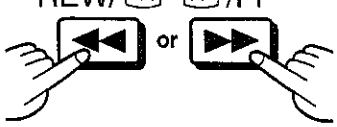
When using a video cassette bearing the "P" mark or an S-VHS-C video cassette, the Remaining Tape Counter Indication may not be very precise.

At every press of the [MEMORY] Button, the Counter Indication will change as follows:



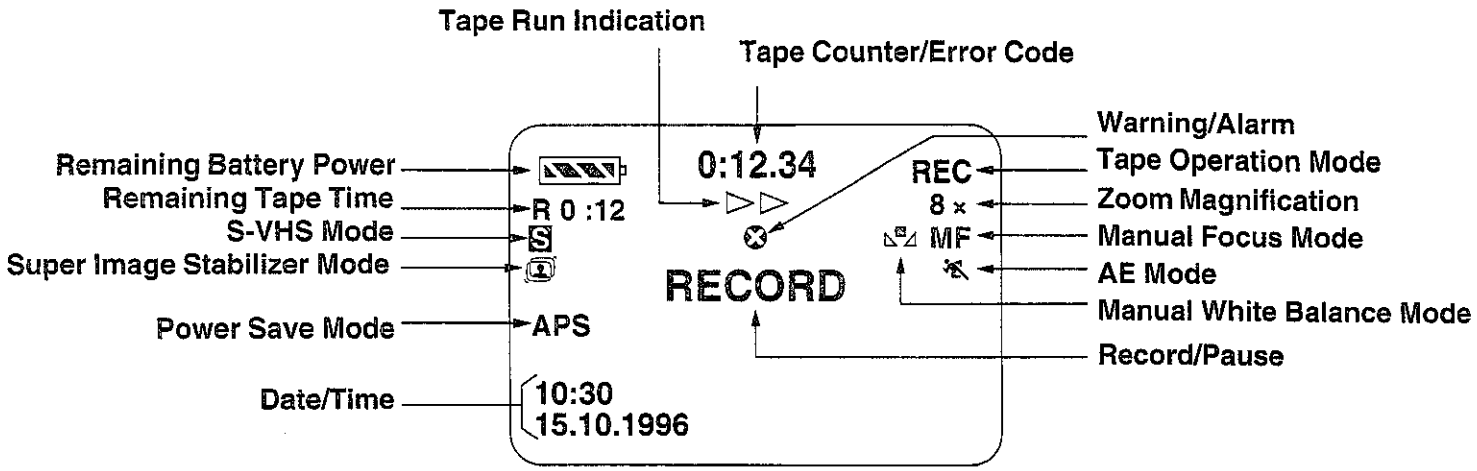
Tape Counter Indication

Memory Indication "M" appears with Tape Counter Indication

		Remarks, etc.
		●If you playback a tape on which no recording has ever been made, the Tape Counter Indication does not change. ●If you take out the Cassette or remove the Battery Pack, the Tape Counter automatically resets to "0:00.00". ●If you rewind the tape further than the tape counter position "0:00.00", the minus sign "–" appears in front of the Tape Counter Indication.
2 **■ To Reset the Tape Counter:** RESET 	**3** REW/◀◀ ▶▶/FF 	
		●When you start recording or playback, the "R" Indication flashes for a few seconds in the Viewfinder, while the Movie Camera calculates the Remaining Tape Time. ●When the Remaining Tape Time becomes less than 2 minutes, the Indication "R" and the Remaining Tape Time start to flash.

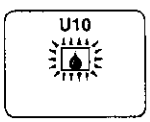
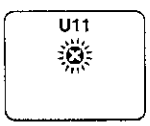
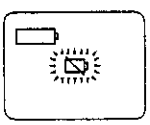
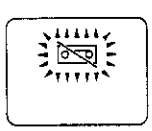
Quick Reference Guide to the Indications in the Viewfinder

The following indications are displayed in the Viewfinder to inform you about the condition of the Movie Camera.

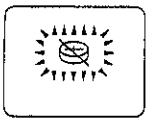
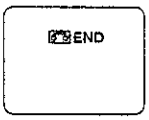


● The illustrations in the following explanations show only the indication(s) pertaining to the corresponding explanation.

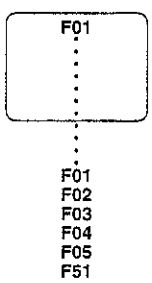
1 Warning/Alarm Indications

Viewfinder	Condition	Page
	**Condensation** Condensation has formed inside the Movie Camera. Wait until the "U10/ " Indication disappears.	56
	**Video Head Clogging** Dirt, dust and particles of the tape coating have accumulated on the video heads. Have the heads cleaned by qualified Service Personnel.	56
	**Remaining Battery Power** The 4 segments of the Remaining Battery Power Indication " " begin to disappear one after another as the power of the Battery Pack weakens. When only the last segment remains, the " " Indication starts to flash in the centre of the Viewfinder. When the last segment has disappeared, the "CAMERA" Indication Lamp flashes for a few seconds, and then the Movie Camera automatically switches itself off. Replace the exhausted Battery Pack with a fully charged one.	10
	**Tape** When no video cassette is inserted or when the tab of the inserted video cassette is broken out, this indication flashes. Insert a video cassette with intact tab.	12, 53

1 Warning/Alarm Indications (cont.)

Viewfinder	Condition	Page
	**Built-in Lithium Battery** The Built-in Lithium Battery is exhausted. Recharge it.	15
	**End of the Tape** When the tape has reached its end, this indication appears. Insert a new video cassette.	—
	Anti-Ground-Recording When the Movie Camera is tilted downwards more than about 70° from its normal horizontal position during recording (with the [POWER SAVE] Switch set to "ON"), the Movie Camera automatically switches over to the Recording Pause Mode. If the Movie Camera is then returned to its normal horizontal recording position, the "CHK" Indication will flash in the Viewfinder.	45

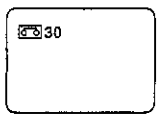
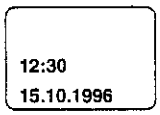
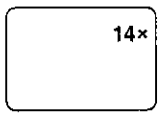
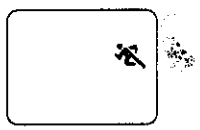
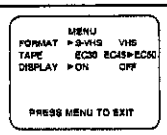
2 Error Code Indications

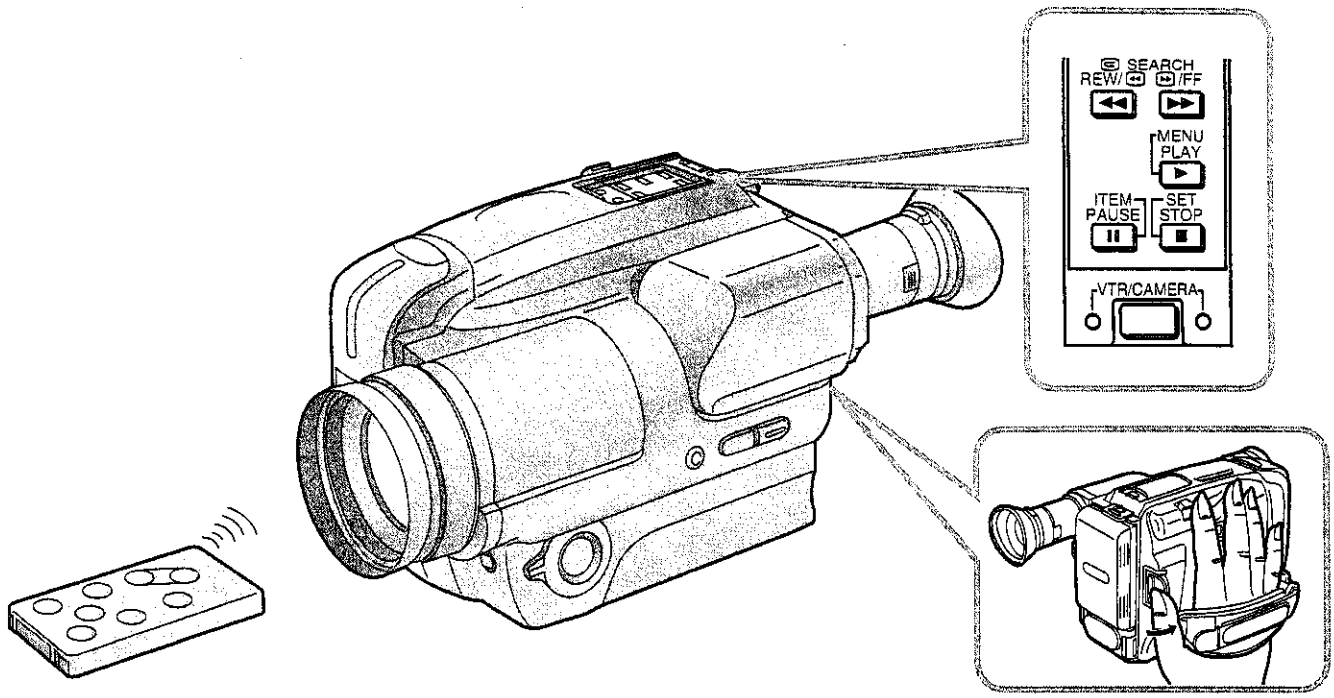
Viewfinder	Condition	Page
	**Error Code** When the "F. ." Indication appears in the Viewfinder, some malfunction has occurred. If the indicated error code is between "F01" and "F05", the Movie Camera will turn itself off automatically one minute after the "CAMERA" Lamp has started to flash. (When the indication is "F51" or "F52", the Movie Camera will not turn off automatically.) In this case, write down the error code and tell it to the service personnel. F01: Locked Take-up Reel F02: Locked Supply Reel F03: Locked Unloading Mechanism F04: Locked Loading Mechanism F05: Locked Head Cylinder F51: Locked Focus Motor F52: Locked Zoom Motor	—

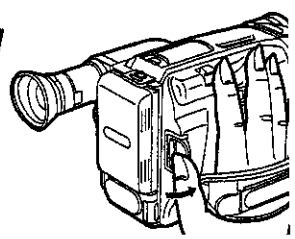
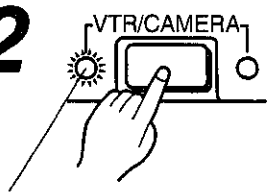
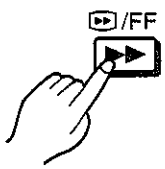
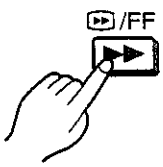
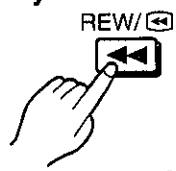
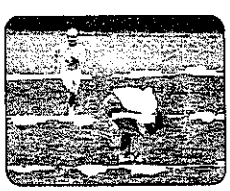
Quick Reference Guide to the Indications in the Viewfinder (cont.)

3 Filming/Playback Indications

Viewfinder	Condition	Page
RECORD	**Recording Mode (large indication)** When the Recording Start/Stop Button is pressed from the Recording Pause Mode, this indication is displayed for approx. 1 second.	16
REC	**Recording Mode (small indication)** This indication appears approx. 1 second after you start recording and remains displayed until you stop recording. "REC" means Recording.	16
▷▷	**Tape Run Indication**	16
PAUSE	**Recording Pause Mode (large indication)** When the Recording Start/Stop Button is pressed from the Recording Mode, this indication is displayed for approx. 1 second.	17
PAUSE	**Recording Pause Mode (small indication)** This indication appears approx. 1 second after you pause the recording and remains displayed until you restart the recording, change over to the VTR Mode or turn the Movie Camera off.	17
CHK	**Rec Check Mode** This indication is displayed while the last 2–3 seconds of the last recorded scene are being played back. "CHK" means Check.	42
S	**S-VHS Format**	37
▷	**Playback/Search Mode**	25 43
▷▷	**Fast Forward/Cue Mode**	24
◁◁	**Rewind/Review/Camera Search Mode**	24 42
II	**Still Playback Mode**	25
0:00.00	**Tape Counter**	18
M 0:00.00	**Tape Counter with activated Memory Function** "M" means Memory.	18
R 0:30	**Remaining Tape Time** "R" means Remaining.	18

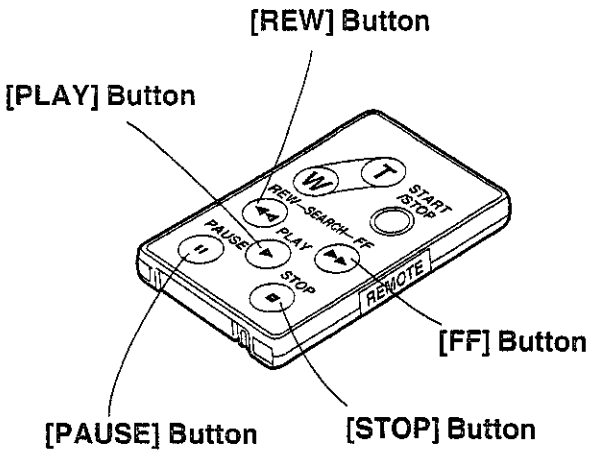
Viewfinder	Condition	Page
	**Tape Length** The Tape Length Indication can be selected with the Menu Mode.	18
	**Date and Time**	15
	**Zoom Magnification** When zooming in on a subject, the indicated zoom magnification value increases.	16
	Manual White Balance Adjustment Mode	33
	**Sports Mode** This indication is displayed when you select the Sports Mode with the [AE] Selector.	38
	Portrait Mode This indication is displayed when you select the Portrait Mode with the [AE] Selector.	38
	Low Light Mode This indication is displayed when you select the Low Light Mode with the [AE] Selector.	38
	Manual focus Mode "MF" means Manual Focus.	28
	Index While this indication is flashing, an index signal is being recorded.	17
	Power Save Mode This indication is displayed when the [POWER SAVE] Switch is set to "ON".	44
	Manual Recording Mode This indication is displayed when you select the Manual Recording Mode with the [AE] Selector. In this mode, you need to adjust the focus and the white balance adjustment manually. "MNL" means Manual.	28 32
	Super Image Stabilizer Mode	36
	Hi-Fi Mode During playback of Hi-Fi sound, the "Hi-Fi" Indication is displayed in the Viewfinder.	—
	**Menu Mode** This Indication is displayed when pressing the [MENU/PLAY] Button.	36

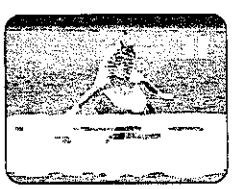


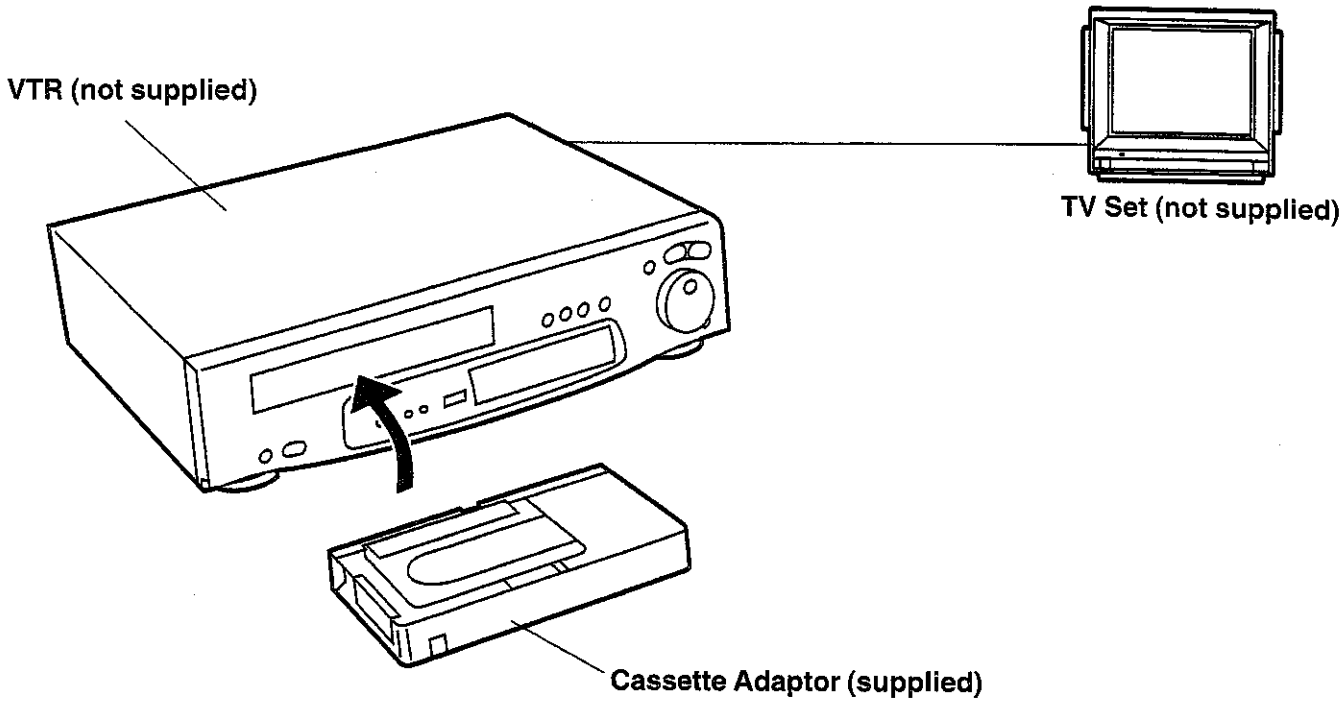
Title	Procedure	
Playing Back on the Viewfinder or a TV **[To Play Back Via a TV Set]** 1. Connect the Movie Camera to a TV set. (p. 8) 2. Follow steps 1 through 4 on the right.	**1**  **Turn the [POWER] ON/OFF Switch out.**	**2**  **The "VTR" Indication Lamp lights up.**
Rewinding or Fast-Forwarding the Tape Perform these operations with the Movie Camera in the VTR Stop Mode ("VTR" Indication Lamp is lit).	**■ For Fast-Forwarding:**  	**■ For Rewinding:**
Using the Cue, Review and Still Playback Functions During Normal Playback	**■ For Cue Playback:**  **Keep pressed.**	**■ For Review Playback:**  **Keep pressed.**
	Cue Playback Mode 	**Review Playback Mode**

■ Remote Controller

Playback, Fast-forward, Rewind, Stop and Pause operations can be operated with this Remote controller.

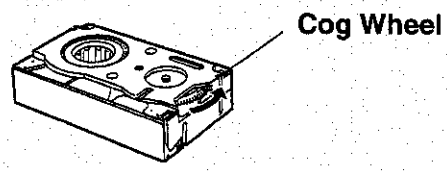


		Remarks, etc.
3 REW/◀◀ **The tape stops automatically when it reaches the beginning.**	**4** MENU PLAY	●If you reach the end of the tape during playback, the tape rewinds automatically. **■ To Stop the Playback** Press the [SET/STOP] Button.
		●If you reach the end of the tape during Fast-Forwarding, the tape rewinds automatically. ●If you reach the beginning of the tape during Rewinding, the tape stops automatically.
■ For Still Playback: ITEM PAUSE	**■ To Return to Normal Playback:** ITEM PAUSE	●The sound is played back only during normal playback. ●In the Cue, Review and Still Playback Modes, horizontal noise bars appear in the picture, or the picture may become black and white or distorted. However, this is normal and not a malfunction. ●If the Movie Camera is left in the Still Playback Mode for about 6 minutes, it will switch over to the Stop Mode to protect the tape and the video heads.
Still Playback Mode 		



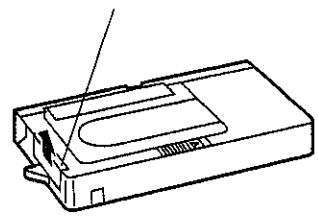
Title	Procedure
Playing Back on a VTR, Using the Supplied Cassette Adaptor	

■ Tighten the Tape



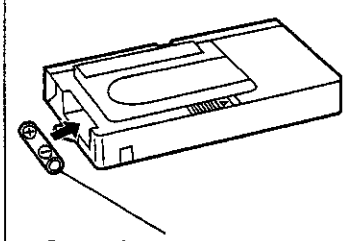
Before inserting a video cassette, check that the tape is tight. If it is loose, tighten it by turning the cog wheel in the direction of the arrow.

1



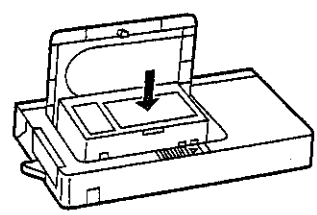
Remove the Battery Compartment Cover.

2



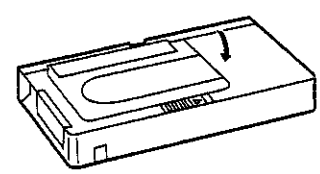
Insert the Battery (R6).

5



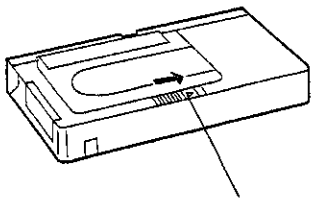
Insert the recorded video cassette.

6



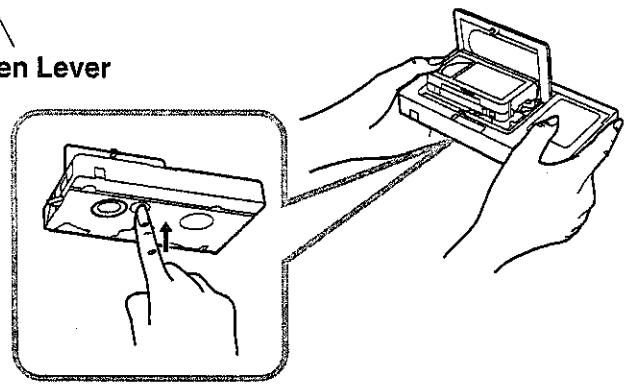
Close the Top Cover.

1 Slide the Open Lever.

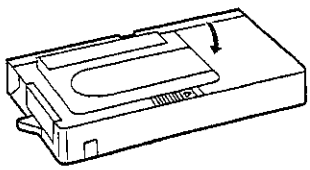


Open Lever

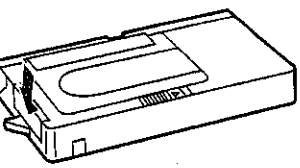
2 Push out the video cassette from the bottom of the Cassette Adaptor and remove the video cassette.



3 Close the Top Cover.

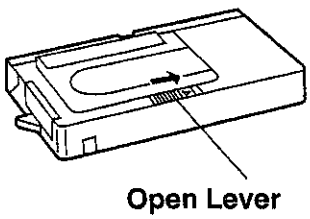


3



Re-attach the Battery Compartment Cover.

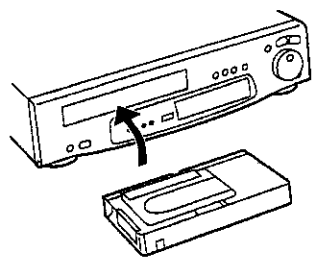
4



Open Lever

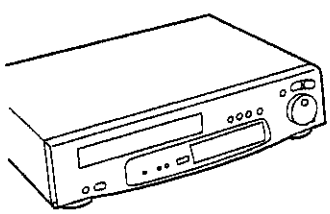
Slide the Open Lever.

7



Insert the Cassette Adaptor into the VTR.

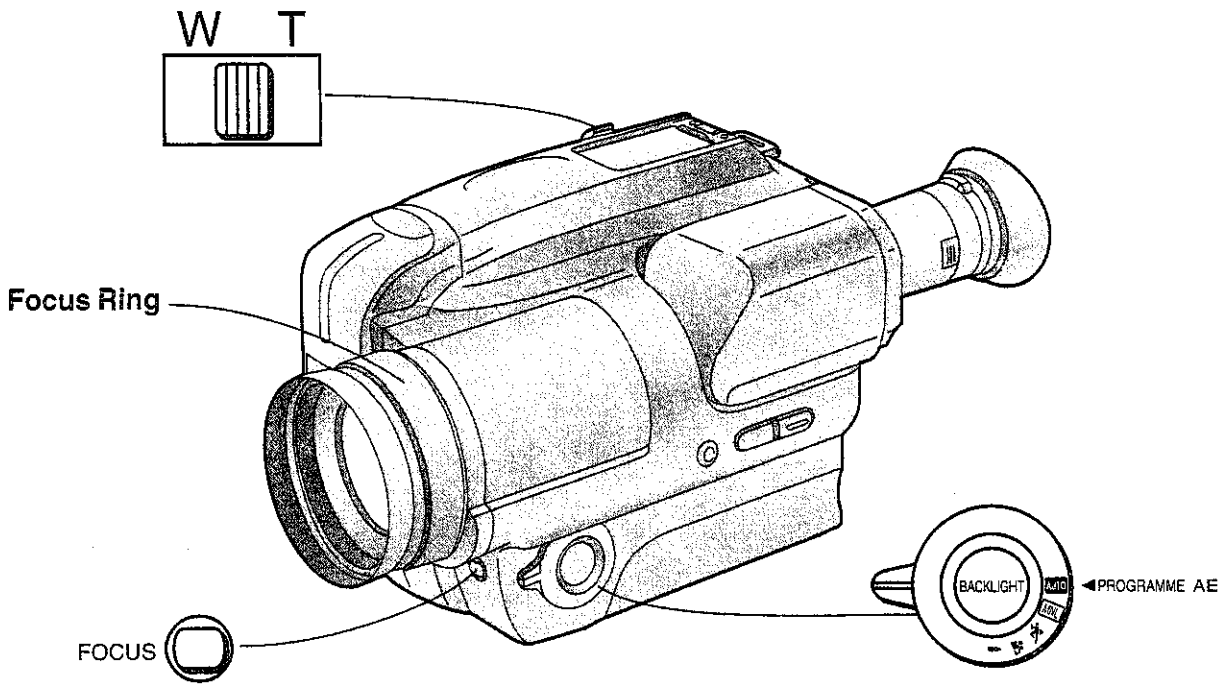
8

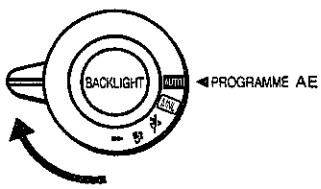
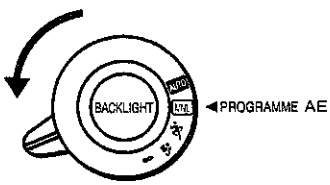


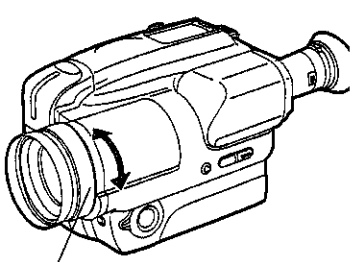
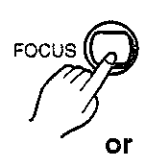
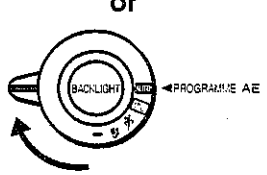
Operate the VTR.

Remarks, etc.

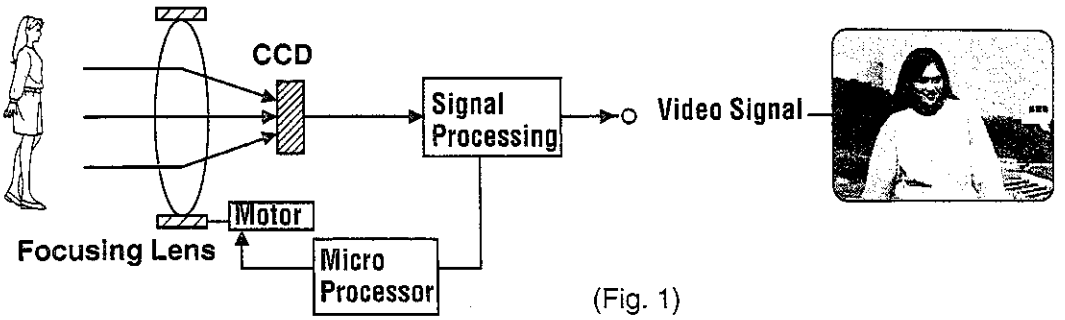
- If you want to get optimum picture quality, it may be necessary to adjust the tracking control on the VTR.
- Never insert the Cassette Adaptor into a VTR unless it is loaded with a video cassette.
- Do not insert the Cassette Adaptor into a VTR and take it out again without running the tape, because this could loosen the tape.
- When you load the video cassette into the Cassette Adaptor or remove it, be careful not to touch the tape.
- After use, take the video cassette out from the Cassette Adaptor.



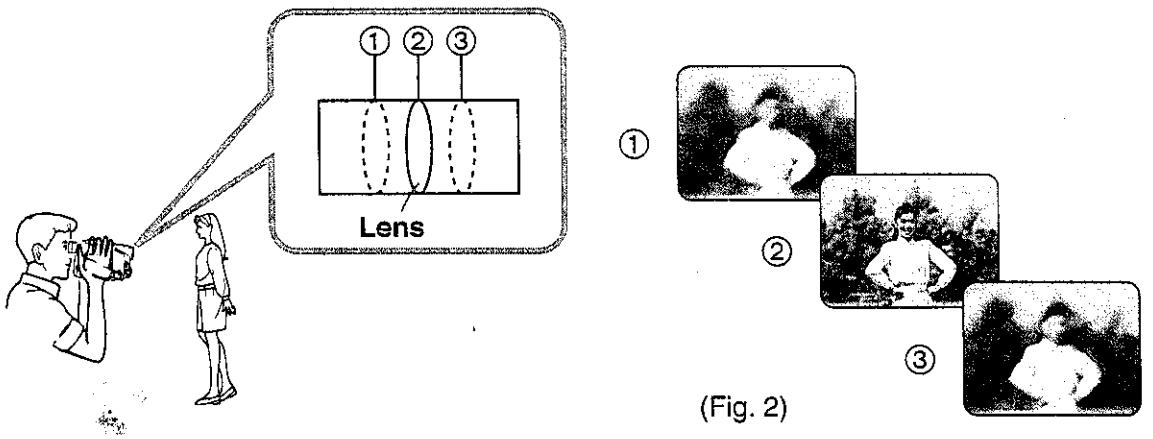
Title	Procedure	
Recording in the Auto Focus Mode	***1***	
When the [AE] Selector is set to "AUTO", the Movie Camera will automatically focus precisely on almost any subject located in the centre of the Viewfinder. "AE" means Auto Exposure. ●When [AE] Selector is set to a position other than "AUTO" and the "MF" Indication is displayed in the Viewfinder, press the [FOCUS] Button to make the "MF" Indication disappear.		
Recording in the Manual Focus Mode	***1***	***2***
		
	The "MNL" Indication appears in the Viewfinder.	**The "MF" Indication appears in the Viewfinder.**

		Remarks, etc.
		●For detailed explanations about focusing, see pages 30 and 31.
3  **Focus Ring** **Adjust the Focus Ring until the subject is in focus.**	**■ To Cancel the Manual Focus Mode:**  **or**  **Press the [FOCUS] Button to make the "MF" indication disappear. Or reset the [AE] Selector to "AUTO".**	**■ Hints for Manual Focus Adjustment** ●To ensure that the subject remains precisely focussed at any zoom setting, first zoom in on the subject (push Zoom Lever toward "T") until it fills the Viewfinder ①. After adjusting the focus, zoom out (push Zoom Lever toward "W") to frame the subject as desired ②. ① ② ●If you adjust the focus in the wide-angle setting, the subject may go out of focus when you later zoom in on the subject.

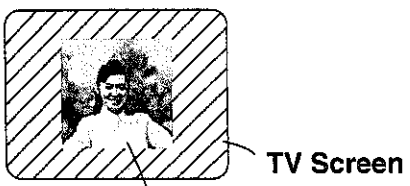
■ Operation Principle of the Auto Focus Mode (Automatic Focusing)



(Fig. 1)



(Fig. 2)



(Fig. 3)

Image area on which the Auto Focus Mode adjusts the focus.

■ Focusing

If you look at an object through a magnifying glass and move it closer or further away from your eye, you will reach a point where the object becomes clearly visible, and when you move it past that point, it will become blurred again. Being focused or in focus means that the subject is seen with optimum clarity and sharpness. The distance between the lens and the point where the rays of light come together is called "focal distance" or "focal length" and it depends on the size and shape of the lens.

•In Human Eyes

Human eyes have lenses as well, and when we look at objects at different distances, the shape of these lenses changes automatically so that we can always see these objects clearly.

•In the Movie Camera

The image of the subject enters the Movie Camera through the lens and is converted into an electrical signal (video signal) for recording onto magnetic tape. In the Movie Camera, the "Auto Focus" system automatically adjusts the focal distance by moving the focusing lens forward or backward.

■ The Auto Focus Mechanism of this Movie Camera

- In Movie Cameras, one of the following two methods is generally used:

1) Infrared Focusing: The recording distance is calculated and adjusted based on the time it takes for an infrared signal emitted from the front of the Movie Camera to be bounced off the subject and received back by a sensor on the Movie Camera.
2) Camera-Internal Electronic Focusing: The focus is adjusted based exclusively on the image received by the Movie Camera and the resulting picture signal.

This Panasonic Movie Camera employs the Internal Electronic Focusing Method.

- As shown in Fig. 1 on the left page, when you aim the Movie Camera at the subject you want to record, the microprocessor moves the lens little by little based on the information about vertical contours of the subject in the picture signal. At the point where the vertical contours of the subject become sharpest, it judges that the subject is in focus and stops the lens. (See Fig. 2.)
- Special Characteristics of the Movie Camera's Automatic Focus Adjustment Mode

(A) It adjusts the focus for sharpest vertical lines.
(B) It adjusts the focus on parts of the subject with strong contrast.
(C) It adjusts the focus only on the centre part of the picture on the viewfinder screen. (The area where the subject is in focus is much smaller than the TV screen, as shown in the Fig. 3.)

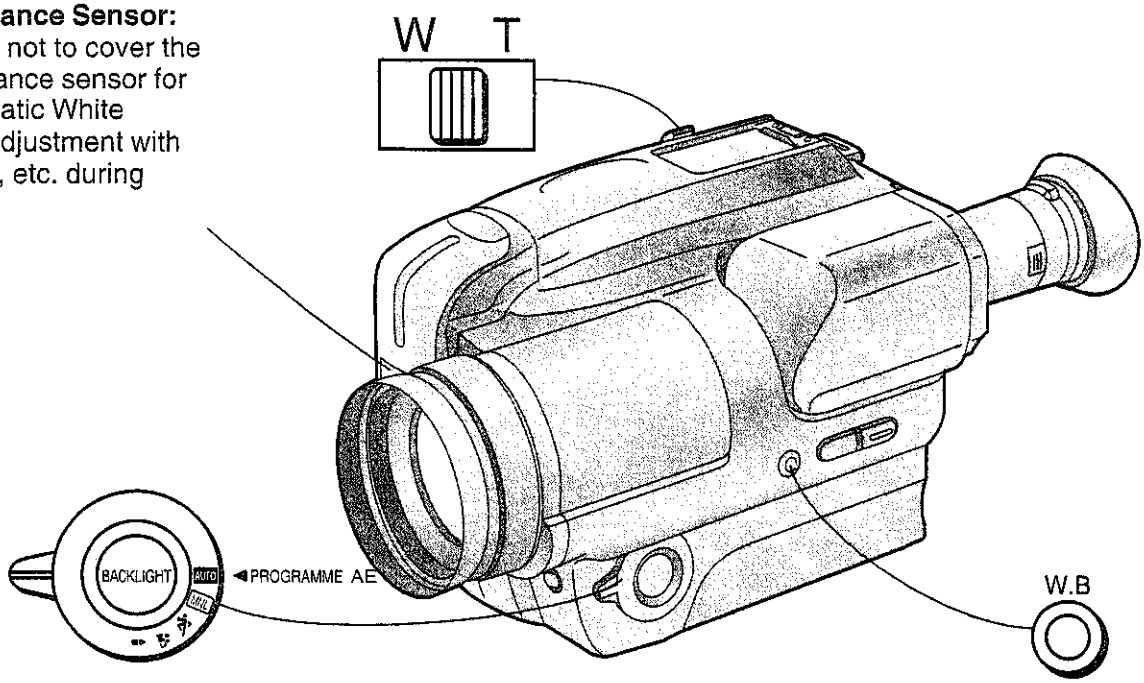
Unlike the human eyes, however, the Movie Camera's Auto Focus System cannot change the focus from a distant to a close subject without any delay. Therefore, use the Manual Focus Mode when you are going to record the following types of subjects or in the following kinds of places:

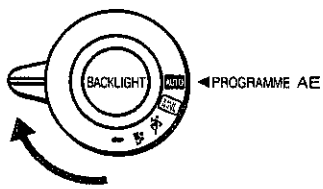
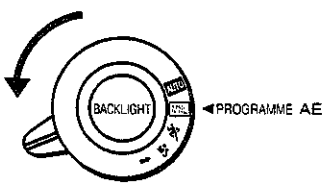
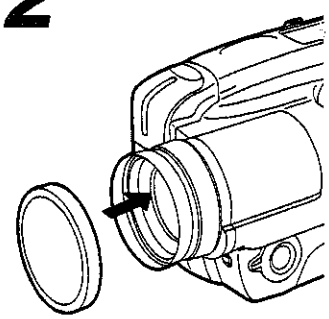
Subjects with Shiny Surfaces or Much Light Reflection As the Movie Camera adjusts the focus on the objects with shiny surfaces or much light reflection, the subject may go out of focus. • The subject may be out of focus when it is recorded at the seaside in the evening, under firework illumination or when special kinds of lights are used.	**Fast-moving Subjects** As the lens is moved mechanically, it cannot follow fast-moving subjects without delay. • Subjects like a quickly and abruptly moving children may temporarily go out of focus.	**Subjects with Weak Contrast** As the Movie Camera adjusts the focus based on vertical contours in the picture, subjects with little contrast may be out of focus. • When recording a flat white wall, for example, the Movie Camera has no information by which it can adjust the focus correctly.
Subjects with a Part of It Near the Movie Camera and Another Part Far Away from It As the focus is adjusted on the centre part of the image, it is difficult to bring the distant part of the subject in focus. • When you want to record a person with a distant mountain behind, it is not possible to focus on both.	**Subjects Behind Moving Objects** As the focus is adjusted on the person or object that passes between the Movie Camera and the subject, the subject temporarily go out of focus. • When recording a subject across a street on which cars are running, the subjects may go in and out of focus.	**Subjects with Dark Surfaces** If the amount of light entering the lens is greatly reduced, the Movie Camera has very little information by which to adjust the focus. • When recording persons in dark surroundings, precise focusing may not be possible.

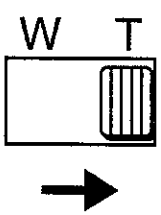
- Precise focusing may also not be possible for subjects that have no vertical contours or are behind glass covered with dirt, dust or water droplets.
- Finger print marks on lens may cause focus not to operate clearly. When at wide angle the Movie Camera may attempt to focus onto the finger prints (treating them as a MACRO Subject). Check and clean the lens correctly.
- If recording in a moving vehicle focus accuracy may be impaired due to the following:
  a) Dirt or water droplets on the car windows and recording through glass may change the focus point
  b) Scenery changing too quickly, no time for the camera to adjust focus
  c) Distance between subject and camera always changing

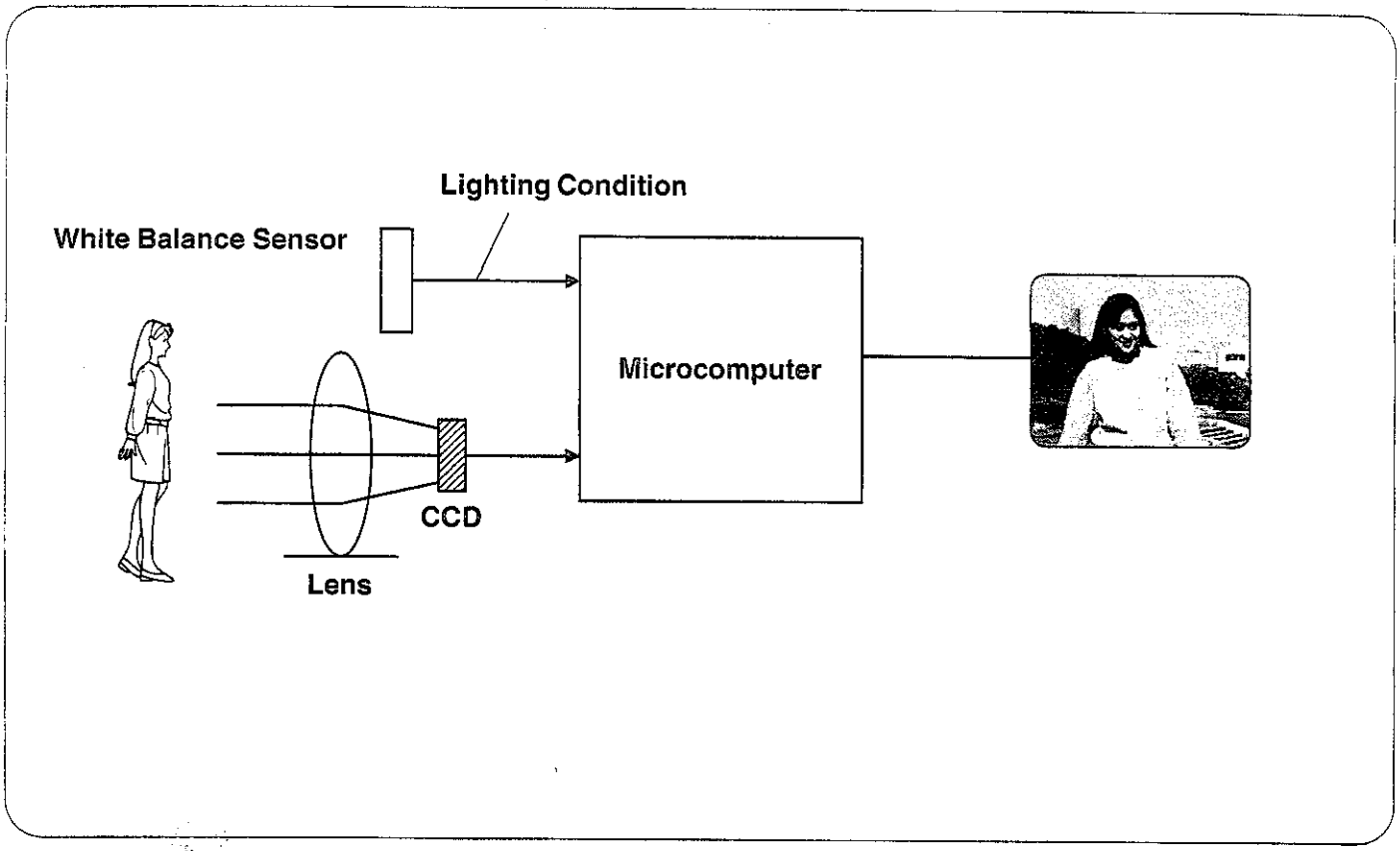
  We suggest you use Manual Focus. Please refer to pages 28–29 "Recording in Manual Focus Mode" in your operating instructions.

White Balance Sensor:
Be careful not to cover the White Balance sensor for the Automatic White Balance Adjustment with your hand, etc. during recording.



Title	Procedure	
Recording with Automatic White Balance Adjustment	***1***	
When the [AE] Selector is set to "AUTO", it is possible to record pictures with natural colours under almost any recording condition. ●When the [AE] Selector is set to a position other than "AUTO" and the "◪" Indication is displayed in the Viewfinder, press the [W.B] Button to make the "◪" Indication disappear.		
Filming with Manual White Balance Adjustment	***1***	***2***
If there is only one light source: Follow the operation steps **1**~**4** on the right. **Note:** If there are several light sources or if the illumination is weak: In operation step **2**, instead of attaching the Lens Cap, point the Movie Camera at a pure white subject. ●If you want to record under weak illumination, precise Manual White Balance Adjustment may not be possible. In this case, record in the "AUTO" Mode.	 **The "MNL" Indication appears in the Viewfinder.**	 **Attach the Lens Cap and point the Movie Camera at subject.** **or** **Point the Movie Camera at a pure white subject.**

		Remarks, etc.
		●For detailed explanations about the white balance, see pages 34 and 35.
3  **Keep pushed until the Viewfinder becomes completely white.**	**4** **Press for more than 1 second (until "▣" Indication stops flashing).**	●If you want to momentarily use an additional light source with low colour temperature (e.g. halogen lamp) while recording a subject with high colour temperature (e.g. blue sky or TV screen), unnatural colours will result. ●The manually adjusted white balance setting is maintained until you adjust it anew or reset the [AE] Selector to "AUTO". However, to ensure optimum colour reproduction, it is recommended to adjust the white balance for each new scene, like the professionals do. This is because even slight changes in the lighting that are not noticeable to the human eye could give the picture a reddish or bluish cast. **■ To Cancel the Manual White Balance Adjustment** Press the [W.B] Button. Or reset the [AE] Selector to "AUTO".



■ White Balance

In addition to sunlight, there are various kinds of electric lights in use today, such as incandescent lamps, fluorescent lamps, etc. The colour of the subject differs depending on the light that falls on it.

•Human Eyes
can easily adjust to different kinds of lighting and recognize an object as having the same colour, even under different light.

•Movie Cameras
do not have such an adaptability. Therefore, if the subject were recorded without any colour adjustment, the lighting would influence the colouring of the reproduced picture, giving it a bluish or reddish tint. To prevent this, an adjustment called "White Balance Adjustment" needs to be performed on the Movie Camera, either automatically or manually.

■ White Balance Adjustment

This adjusts the Movie Camera to pure white under different lighting conditions. After white is set, the Movie Camera can compensate for the colour in the lighting and adjust the other colours accordingly. As white is the combination of all colours (light), if white colour is correctly adjusted, recording scenes with natural colours is possible under almost any lighting condition.

■ Automatic White Balance Adjustment

To provide natural colours in the most common lighting situations, this Movie Camera has optimum settings for these conditions stored in memory. It determines the colour of the light entering through the lens as well as through the White Balance Sensor window and selects the matching colour setting from among the stored settings. This function is called "Automatic White Balance Adjustment".
However, as the optimum settings of only several types of light sources are stored in memory, the Automatic White Balance Adjustment does not work with sufficient precision in all conditions.
In some cases, the Manual White Balance Adjustment should be used.

■ Manual White Balance Adjustment

With the Manual White Balance Adjustment, the user can adjust the colour compensation for the light source used for a particular scene. For this adjustment, the Lens Cap is put on the lens and the [W.T] Button pressed, so the Movie Camera can determine how much the white of the lens cap under the present lighting deviates from the value for pure white stored in memory. Alternatively, the user can aim the Movie Camera at a pure white object (e.g. a sheet of pure white paper) instead of using the White Lens Cap.
The chart below shows the range of lighting sources within which the Automatic White Balance Adjustment can provide accurate compensation. For recording under lighting conditions outside this range, use the Manual White Balance Adjustment because the Automatic White Balance Adjustment cannot provide satisfactory results.

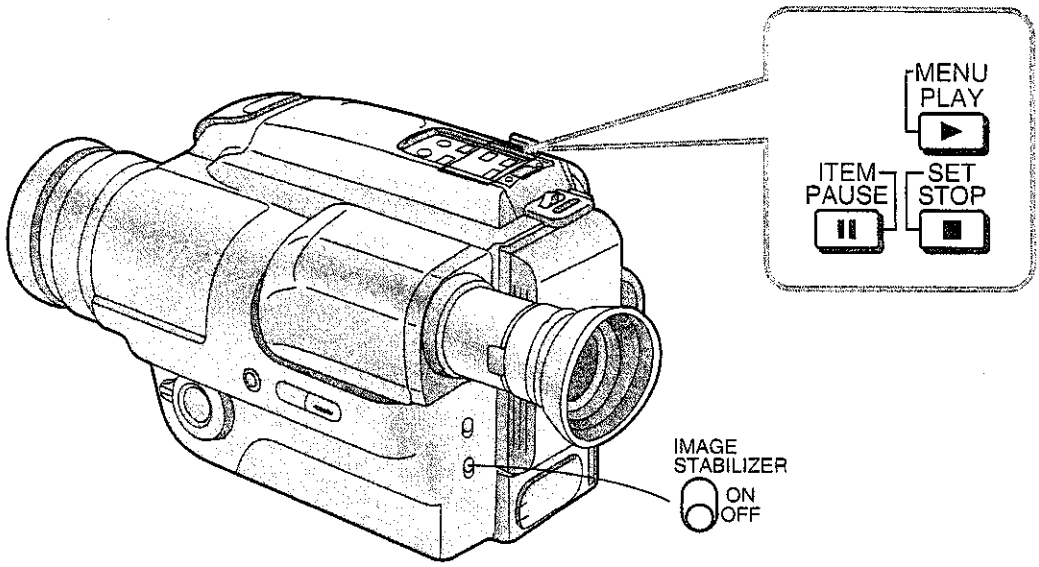
■ Colour Temperature and White Balance

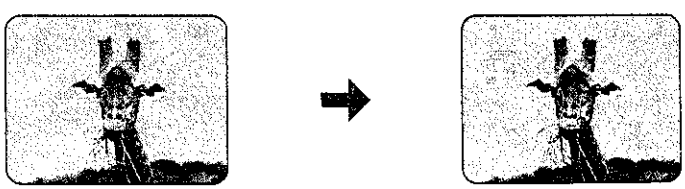
The colour temperature of the light source is measured in Kelvin. The higher the Kelvin value is, the more bluish is the light; the lower the value, the more reddish is the light. This is not directly related to the brightness.
The table below shows the relationship between natural light, artificial light and colour temperature.

Natural Light	Colour Temperature		Artificial Light	Effect on the picture
•Blue sky	10,000 K			Bluish colour: If you want to record under light sources within this range, use the Manual White Balance Adjustment. (In the Auto White Balance Adjustment, the picture could have a bluish cast.)
•Slightly overcast sky	7,000 K~ 8,000 K	8,000 K~ 9,000 K	•TV screen	
•Cloudy sky (Rain)	6,000 K			
•Sunlight	5,000 K			If you want to record under light sources within this range, you can use the Auto White Balance Adjustment.
		4,800 K	•Fluorescent lamp (white)	Whitish colour
•1~2 hours after sunrise or before sunset	3,000 K~ 4,200 K	2,500 K~ 3,500 K	•Fluorescent lamp (not white) or studio lamp	
•Sunrise or sunset	2,000 K~ 2,500 K	2,000 K~ 2,800 K	•Halogen light bulb	Reddish colour: If you want to record under light sources within this range, use the Manual White Balance Adjustment. (In the Auto White Balance Adjustment, the picture could have a reddish cast.)
		2,000 K~ 2,500 K	•Tungsten lamp	
		1,500 K~ 2,000 K	•Candlelight	

For the following types of scenes, the Automatic White Balance Adjustment cannot provide satisfactory results, even if the light source is within the range described above. Use the Manual White Balance Adjustment instead.

When a Scene is Lit by Several Light Sources	When recording an Outdoor Scene from Inside a Building	When recording in a Very Dark Place
If there is more than one light source for a scene, the Movie Camera cannot decide which of the stored White Balance Adjustment settings to use. Therefore, precise Automatic White Balance Adjustment is not possible in such cases.	As the colour of the light entering through the lens differs greatly from that received by the White Balance Sensor, the Automatic White Balance Adjustment will compensate for indoor lighting and this results in unnatural colours.	As the colour information entering through the lens is greatly reduced, the Automatic White Balance Adjustment cannot correctly compensate for the colour of the lighting and this results in unnatural colours.



Title	Viewfinder
Using the Menu Function ●The Menu Function is used to select the items shown in the Viewfinder on the right. ①: For selecting the VHS mode or S-VHS mode ②: For selecting "EC30", "EC45" or "EC60" according to the video cassette being used. ③: For turning the On-Screen Display Function on or off: When set to "ON", all Indications appear in the Viewfinder. When set to "OFF", only the Warning/Alarm Indications, Tape Operation Mode and Date and Time Indications appear in the Viewfinder.	❶ MENU ① FORMAT ►S-VHS VHS ② TAPE ►EC30 EC45 EC60 ③ DISPLAY ►ON OFF PRESS MENU TO EXIT **(Menu Indication)** ●The above Menu screen shows the original factory settings.
Super Image Stabilizer Function This function compensates for possible shaking of the handheld Movie Camera.	

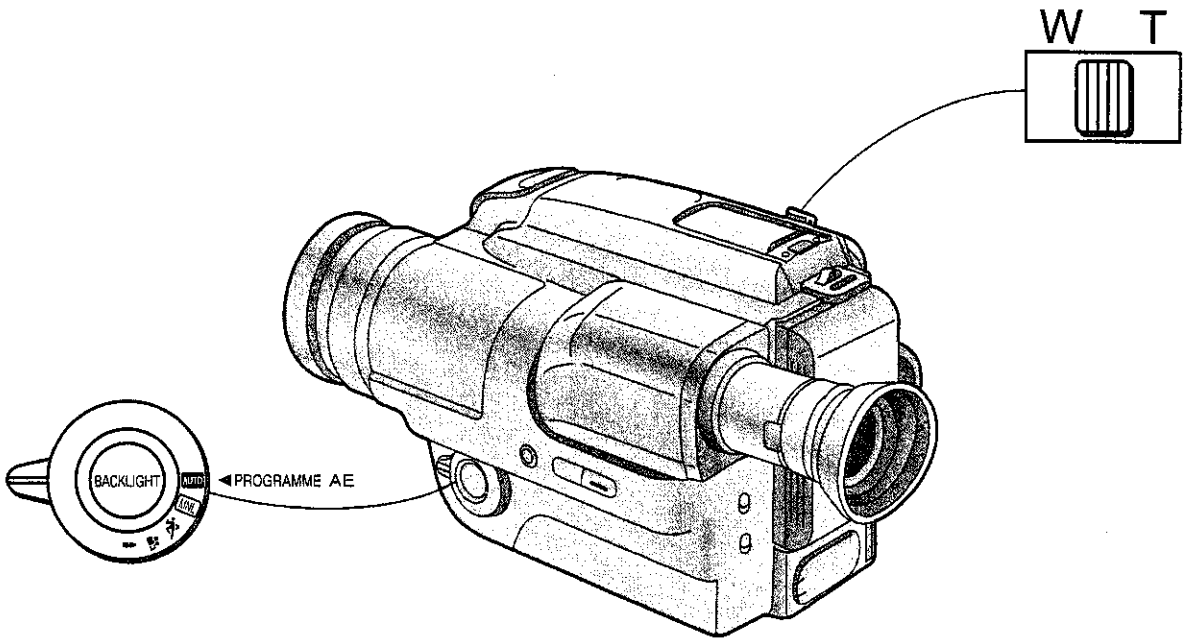
Cautions for Use of the Super Image Stabilizer Function

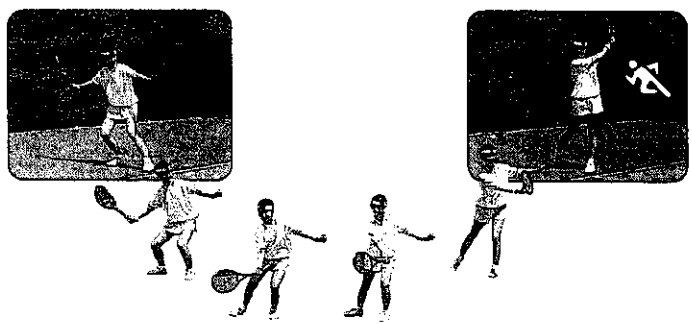
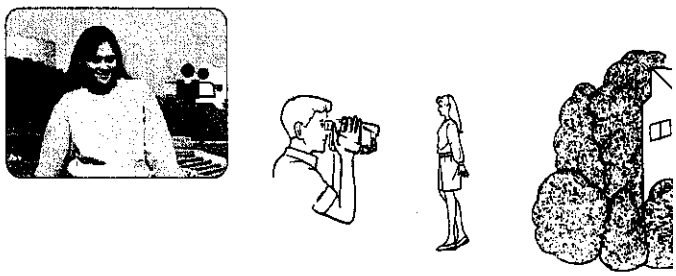
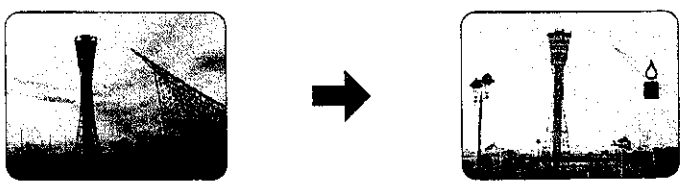
- When you use the Super Image Stabilizer Function, the shutter speed is automatically adjusted between 1/50 s and 1/125 s.
- When you cancel the Super Image Stabilizer Function, the shutter speed is also reset to 1/50 s. However, when you cancel the Super Image Stabilizer Function after recording in the Sports Mode or the Portrait Mode, the shutter speed is not reset to 1/50 s.

If you record the following kind of subjects, the picture stabilizing effect may not be sufficient:

- A subject with horizontal or vertical stripes
- A flat subject
- A dark subject
  (The Super Image Stabilizer Indication "" flashes in the Viewfinder.)
  Increase the amouont of light.
- A subject under many fluorescent lamps
- A fast-moving subject
- A subject with a flat background

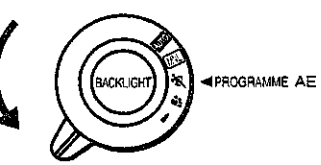
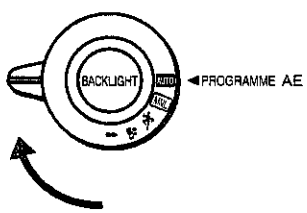
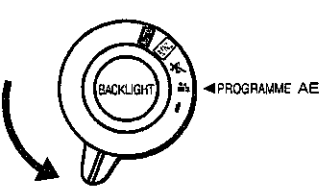
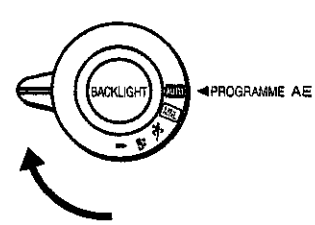
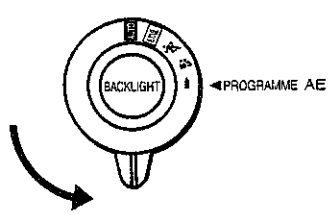
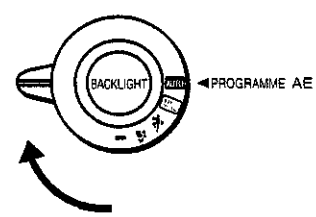
Procedure		Remarks, etc.
1 MENU PLAY **Press while in the Filming Pause Mode.**	**2** ITEM PAUSE **Press and select.** ●The indication of the selected item ❶ flashes.	●While the Menu is displayed, filming is not possible. ●The selections made on the Menu screen will be maintained even when the Movie Camera is turned off. ●It is possible to display the Menu on the TV screen. (For the connection to a TV set, see page 8.) ●When the S-VHS mode is selected, the "S" Indication is displayed in the Viewfinder. (However, when a normal VHS-C video cassette is inserted in the Movie Camera, the "S" Indication does not appear, because recording in the S-VHS mode is not possible on a normal VHS-C video cassette.)
3 SET STOP **Press and select with the "▶" Marks.**	**4 To Return to the Normal Filming Mode** MENU PLAY	
1 IMAGE STABILIZER ON OFF		●This function is especially practical for the following recording situations: 1. Zooming in on a distant subject. 2. Recording while walking. 3. Recording from inside a moving car.

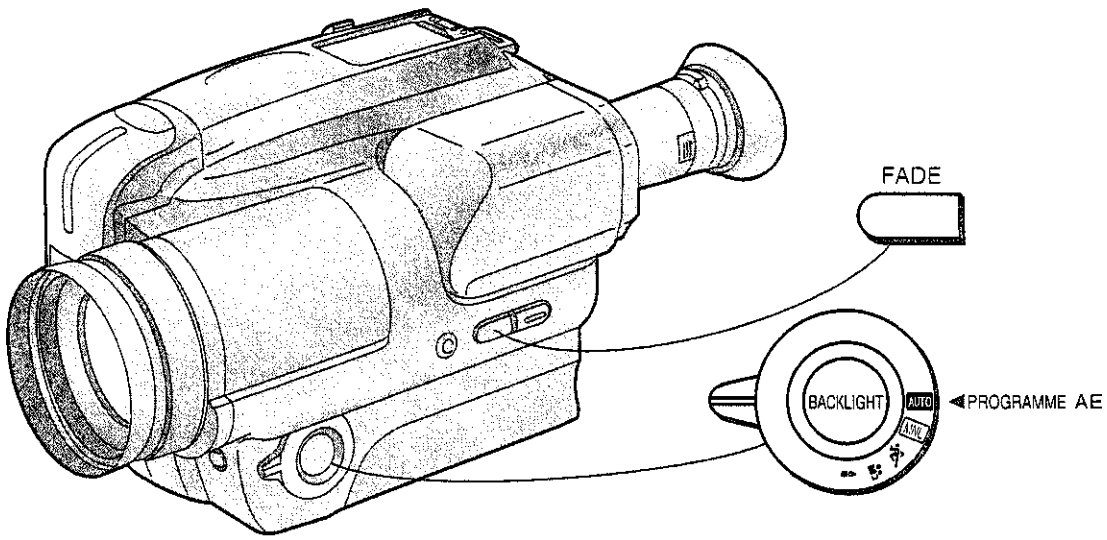


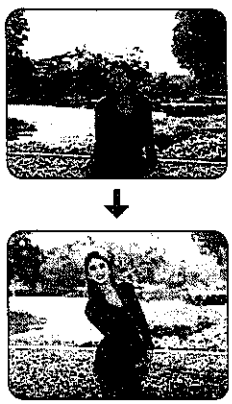
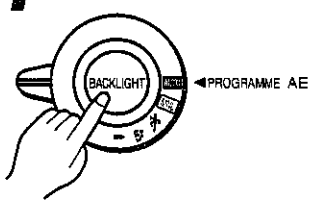
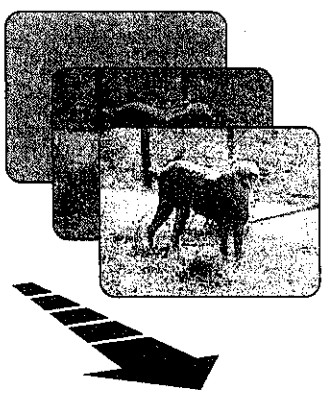
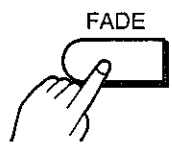
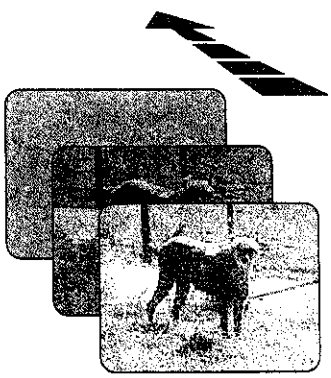
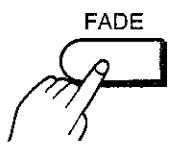
Title	Viewfinder
Recording Fast-Moving Subjects ■ **Using the Sports Mode** Use this function to record sports and other fast-action scenes, if you want to play back these scenes in a VTR using still and slow motion playback for motion analysis. This provides sharp picture contours and enhanced detail.	
Making Subjects Stand out Sharply from the Background ■ **Using the Portrait Mode** In the Portrait Mode, the iris is automatically set to the maximum aperture for a very small depth-of-field. This gives you a sharply focused subject in the centre of the picture with a blurred background and foreground.	
Recording Dark Scenes More Brightly ■ **Using the Low Light Mode** The Low Light Mode lets you brighten up the picture when recording under dim lighting, for example outdoor scenes at dusk, scenes under party lighting or indoor scans under weak room lighting.	

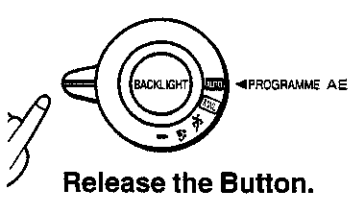
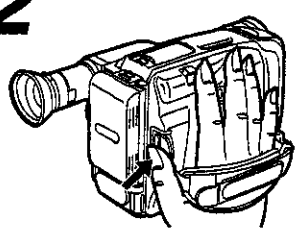
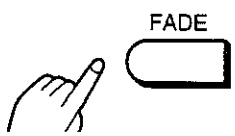
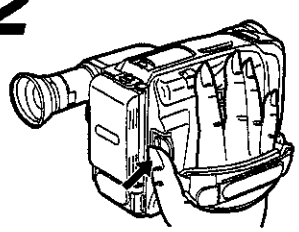
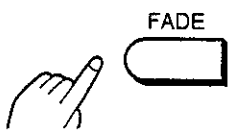
Notes for Use of the Sports Mode

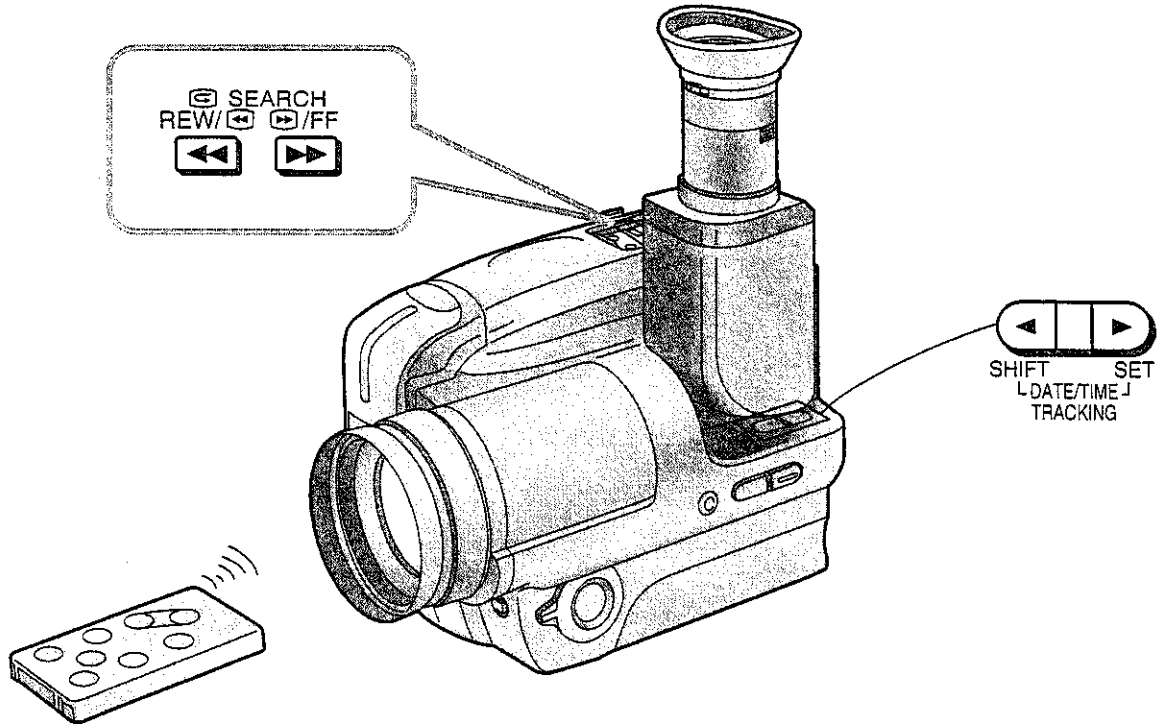
- The subject must be brightly lit by sunlight or other strong light and contain little shadow.
- If you want to record under fluorescent, mercury-vapour or natrium lamps, some flickering may be noticeable.
- The picture may become slightly darker, and during normal playback, the picture movement may not be as smooth as usual.

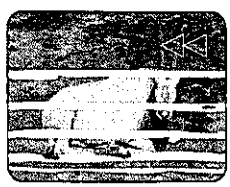
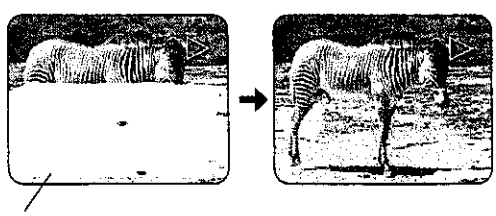
Procedure		Remarks, etc.
1 	**To Return to the Normal Recording Mode:** 	● The shutter speed is automatically adjusted (between 1/50 s and 1/500 s) according to the brightness of the scene. ● If you record under weak lighting, the " " Indication flashes to warn you that the Sports Mode may not be effective.
1 	**To Return to the Normal Recording Mode:** 	● If you want to increase the blurring of the background and foreground, zoom in on the subject.
1 	**To Return to the Normal Recording Mode:** 	● If you use this mode for recording outdoors in daylight, the result will be almost the same as when recording in the normal recording mode. ● There will be a distinct increase in picture noise in low lit areas when using the Low Light Mode. This is normal.



Title	Viewfinder	Procedure
Recording Backlit Scenes When you record a subject that has a strong light source behind it, for example a person with the sun behind it, the face is in the shade and appears too dark. In such a case, you can brighten up the subject by keeping the [BACKLIGHT] Button pressed during recording.		**1**  **Keep pressed.**
Fading In the Picture and Sound At the beginning of a movie, etc. fading in is often used. For example, after recording the title, starting the first scene with the Fade-in Function is very effective.		**1**  **Keep pressed while in the Recording Pause Mode.**
Fading Out the Picture and Sound Fading out is used to create a soft ending or (together with fade-in) for a soft transition from one scene to the next.		**1**  **Press during recording at the point where you wish to fade out.**

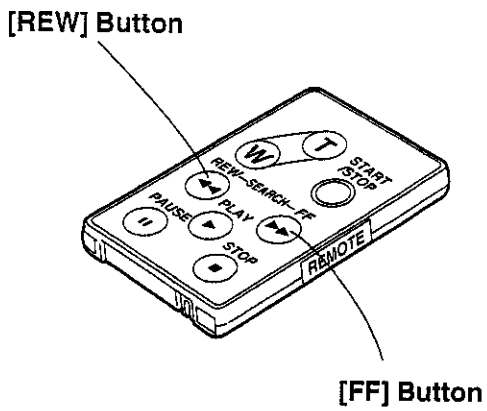
		Remarks, etc.
2 ■ **To Cancel this Function**  **Release the Button.**		●If you record a deep blue sky, it may appear whitish in the playback picture. ●If you record a subject with the sun striking at an acute angle, star-shaped light reflexes may be recorded in the picture. ●If you record a subject with very strong backlight or with a very bright background, e.g. a person indoors in front of a window, it may not be possible to sufficiently brighten up the subject.
2  **Press after the picture in the Viewfinder has disappeared.**	**3**  **Release after approx. 3 seconds.**	
2  **Press after the picture in the Viewfinder has disappeared.**	**3**  **Release.**	

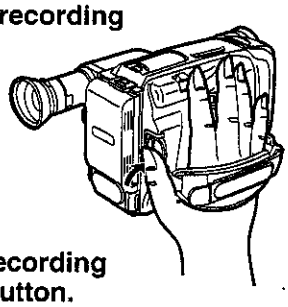
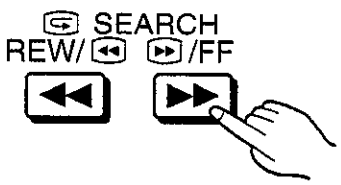


Title	Procedure
Checking the End of a Recorded Scene For occasionally important scenes, use this check function during recording to confirm that the recording has been performed correctly.	**1** REW/ **Press while in the Recording Pause Mode.**
Locating a Point Where You Wish to Add a New Scene (Camera Search Function) Record the individual scene a little longer than actually required. You can then rewind the tape and determine the exact point where you wish to join the next scene. When the [SEARCH] Button is then released, the Movie Camera returns to the Recording Pause Mode.	**1** ■ **Reverse direction** SEARCH REW/ /FF  **Keep pressed while in the Recording Pause Mode.**
Eliminating Picture Distortions by Adjusting the Tracking When playing back a recorded tape, especially a tape recorded on another Movie Camera, horizontal bands of white noise may appear in the picture. If this occurs, you can eliminate them by adjusting the tracking.	 **White noise bands**

■ Remote Controller

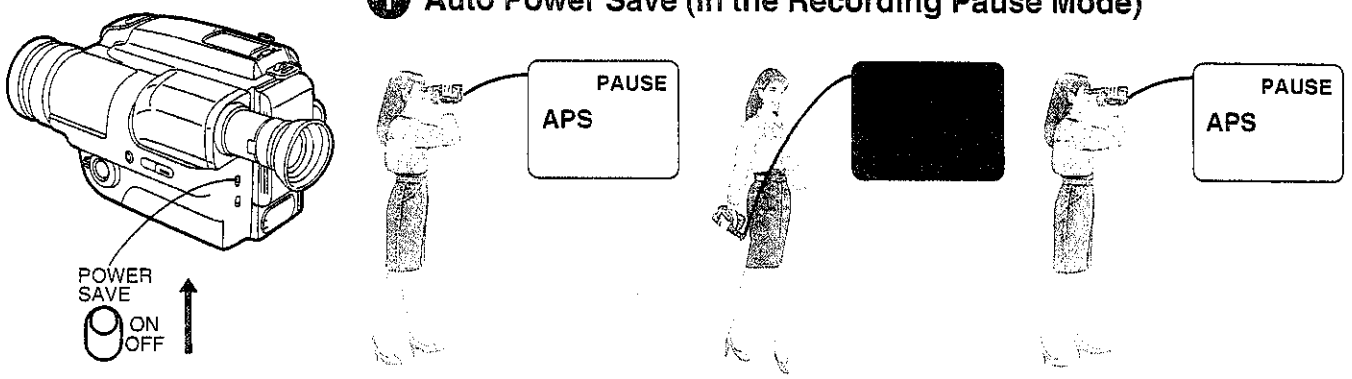
Recording Review and Camera Search Function can be operated with this Remote Controller.



	Remarks, etc.
2 To start the recording again:  **Press the Recording Start/Stop Button.**	●The final 2 seconds of the last recorded scene will be played back in the Viewfinder and then the Movie Camera returns to the Filming Pause Mode.
2 ■ Forward direction  **Keep pressed while in the Recording Pause Mode.**	●If you keep pressing [REW/◀◀] Button: The Indication "◁◁" appears in the Viewfinder. The scene is played back in reverse direction at 3 times normal speed. ●If you keep pressing [▶▶/FF] Button: The Indication "▷" appears in the Viewfinder. The scene is played back in forward direction at normal speed.
1 **Press both the [◀ TRACKING] and [TRACKING ▶] Buttons simultaneously.**	●If you press both buttons simultaneously but the picture quality does not improve, adjust by pressing the [◀ TRACKING] or [TRACKING ▶] Button individually. (It may not be possible to remove the noise bands completely.)

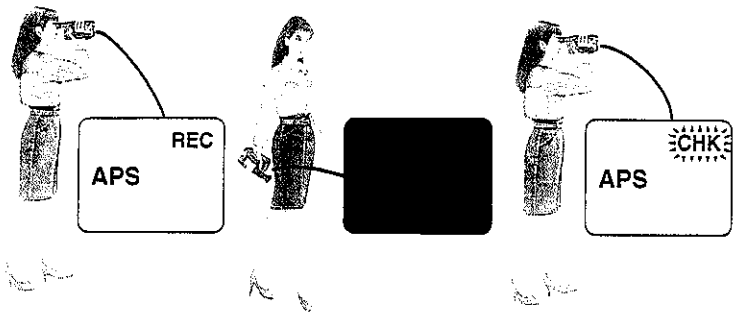
Using the Power Save Functions

❶ Auto Power Save (in the Recording Pause Mode)

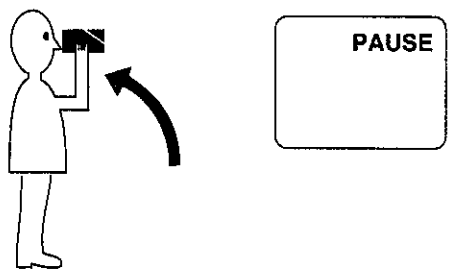
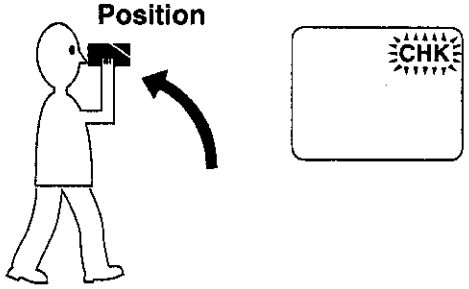
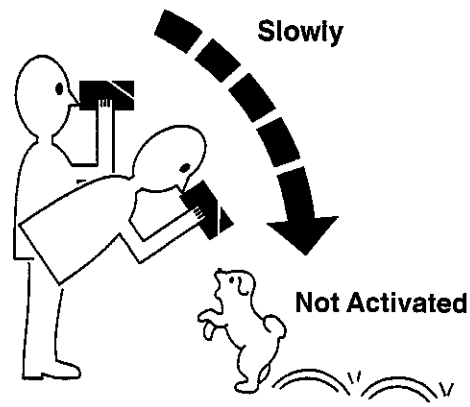


	Movie Camera Mode	Becomes Activated:	Conditions of Movie Camera
❶ Auto Power Save Function	**During Recording Pause** Viewfinder PAUSE APS The "APS" Indication is displayed.	Horizontal Position ●More than about 70° ●More than a few seconds Activated ●When the Movie Camera is tilted downwards by more than about 70 ° from the normal horizontal recording position for more than a few seconds.	●Video and Audio will be faded during this mode so no picture or sound will be present. ●Viewfinder: OFF ●Auto Focus: OFF ●Zoom Motor: OFF ●VTR Indication: Flashes (Green) VTR/CAMERA
❷ Anti-Ground-Recording Function	**During Recording** Viewfinder REC APS The "APS" Indication is displayed.	1) 2) Horizontal Position Quickly ●More than about 70° ●More than a few seconds Activated ●When tilting the Movie Camera downwards by more than about 70° from the normal horizontal recording position for more than a few seconds, and: 1) Walking with the Movie Camera held in the hand or; 2) tilting the Movie Camera quickly in the case of not walking.	●Video and Audio will be faded during this mode so no picture or sound will be present. ●Viewfinder: OFF ●Auto Focus: OFF ●Zoom Motor: OFF ●Recording Mode ↓ Recording Pause Mode ●VTR Indication: Flashes (Green) VTR/CAMERA

❷ Anti-Ground-Recording (in the Recording Mode):



The Anti-Ground-Recording Function is meant as a guide or Indication that irregular recording has occurred. It is up to the user to reposition the tape so as to remove the undesired section of the recording. The Movie Camera only switches the unit to Recording Pause/Power Save Mode, and when the user begins to operate the unit again, the "CHK" Indication appear in the top right hand corner of the Viewfinder.

Result	To Resume Recording	Operating Restrictions
•Saving Power Your Battery Pack lasts longer for actual recording. **•Preventing Lengthy Recording of the Ground** Even if you unintentionally press the Recording Start/ Stop Button when you hold the Movie Camera facing downwards after finishing the recording of a scene, the Movie Camera prevents recording.	**Horizontal Position**  •When you return the Movie Camera to an approximately horizontal position, it automatically resets to the Recording Pause Mode, and you can start recording again by pressing the Recording Start/ Stop Button.	
•Saving Power Your Battery Pack lasts longer for actual recording. **•Preventing Lengthy Recording of the Ground** The Movie Camera automatically switches over to the Recording Pause Mode to stop the unintentional recording.	**Horizontal Position**  •If you return the Movie Camera to an approximately horizontal position, the "CHK" (=Check) Indication flashes in the Viewfinder. This warns you that since the recording may have continued for several seconds, you should rewind the tape a little using the Camera Search Function (p. 42) to locate the end of the last desired scene, before you start recording again.	•If you slowly turn the Movie Camera downwards during recording, the Anti-Ground-Recording Function does not become activated.  •The Anti-Ground-Recording Function is not intended to replace the manual stopping of recording.

Note: When you change locations between scenes or when not planning to record for a longer period time, it is recommended to turn off the Movie Camera with the [POWER] ON/OFF Switch.

Lighting

When you record in the Auto Mode, the Movie Camera always keeps the white balance adjusted to the surrounding illumination. However, when you record in the Manual Mode, it is recommended to frequently adjust the white balance—preferably for each new scene, like the professionals do it. This is because even slight changes in the lighting (that are not noticeable to the human eye) or changes in position of the Movie Camera could give the picture a reddish or bluish cast. In general, the colours tend to become reddish when recording indoors, and under a clear, blue sky they become bluish.

■ Outdoors

Choose a Movie Camera position with the sun in your back, so that the sunlight falls evenly on the subject and makes for a beautiful picture. See the table below and on the page 32–35 to decide whether to record in the Auto or Manual White Balance Adjustment, and whether a Filter Kit (VW-LF43E; optional) or a Video DC Light (VZ-LDCS13E; optional) is necessary to obtain brilliant pictures with vivid colours.

■ Indoors

It is possible to record indoors under fluorescent, halogen, tungsten or even candlelight. However, note that the brighter the subject is lit, the more vivid a picture will be obtained. Therefore, it is recommended to brighten up the scene with additional lighting, such as a Video DC Light (VZ-LDCS13E; optional) or a spot light. However, if you want to capture the special mood of a dimly lit indoor (or outdoor) scene, recording is possible in the Low Light Mode under weak lighting down to only 1 lux.

In Low Light Mode the picture quality may be noisy. This is normal and not a malfunction of the unit.

When using a Video DC light or a spotlight there are some points to keep in mind:

1. The Video DC light is only effective for up to 3 meters in general use.
2. In Close-up recording, for example Photographs, be sure to check for hot spot reflections and shadowing.

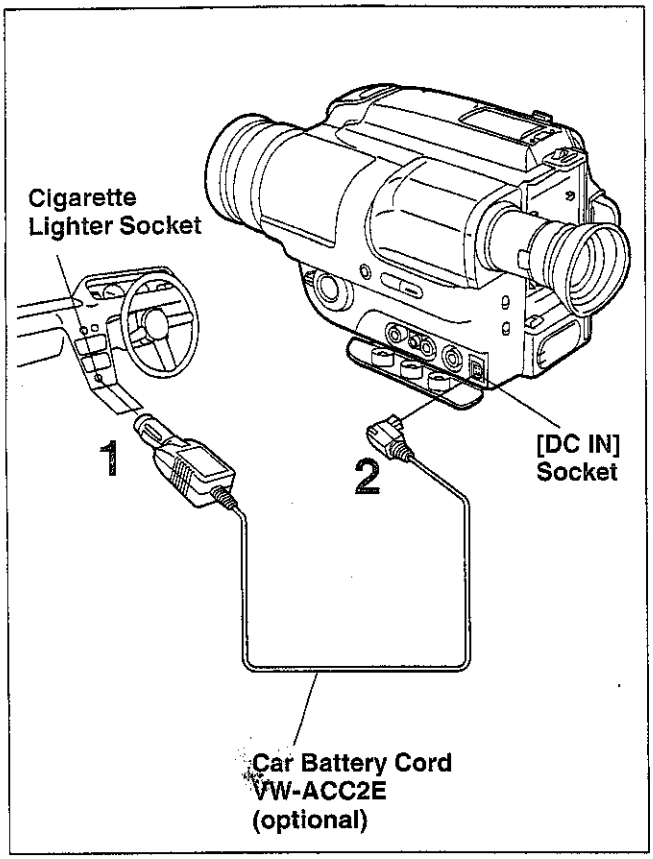
Standard Values of Brightness

The values shown in this table are rough approximations for general reference.

Lux: Unit of illumination (the larger the figure, the brighter the light source)

Lux	Place or Type of lighting	To obtain Pictures with Vivid Colours
100,000	• Snow—covered mountains • Mid-summer beach • Sunlight at noon, clear sky (100,000 lux)	An ND Filter (contained in Filter Kit VW-LF43E; optional) is recommended to dampen the excessive light and obtain stronger colours.
10,000	• Sunlight at 10 AM, clear sky (65,000 lux) • Sunlight at 3 PM, clear sky (35,000 lux) • Sunlight at noon, cloudy sky (32,000 lux) • Sunlight at 10 AM, cloudy sky (25,000 lux)	Range for recording without need for a Filter Kit (VW-LF43E; optional) or additional lighting.
1,000	• Sunlight one hour after sunrise, cloudy sky (2,000 lux) • Sunlight one hour before sunrise, clear sky (1,000 lux)	
500	• Inside a department store, bright office (500–700 lux)	
100	• Street light (50–100 lux)	Additional lighting is recommended for most types of lighting in this range to obtain pictures with vivid colours.
20	• Candle-light at 20 cm distance (10–15 lux)	Additional lighting is necessary to obtain satisfactory picture quality.

Using the Car Battery Cord (Optional)



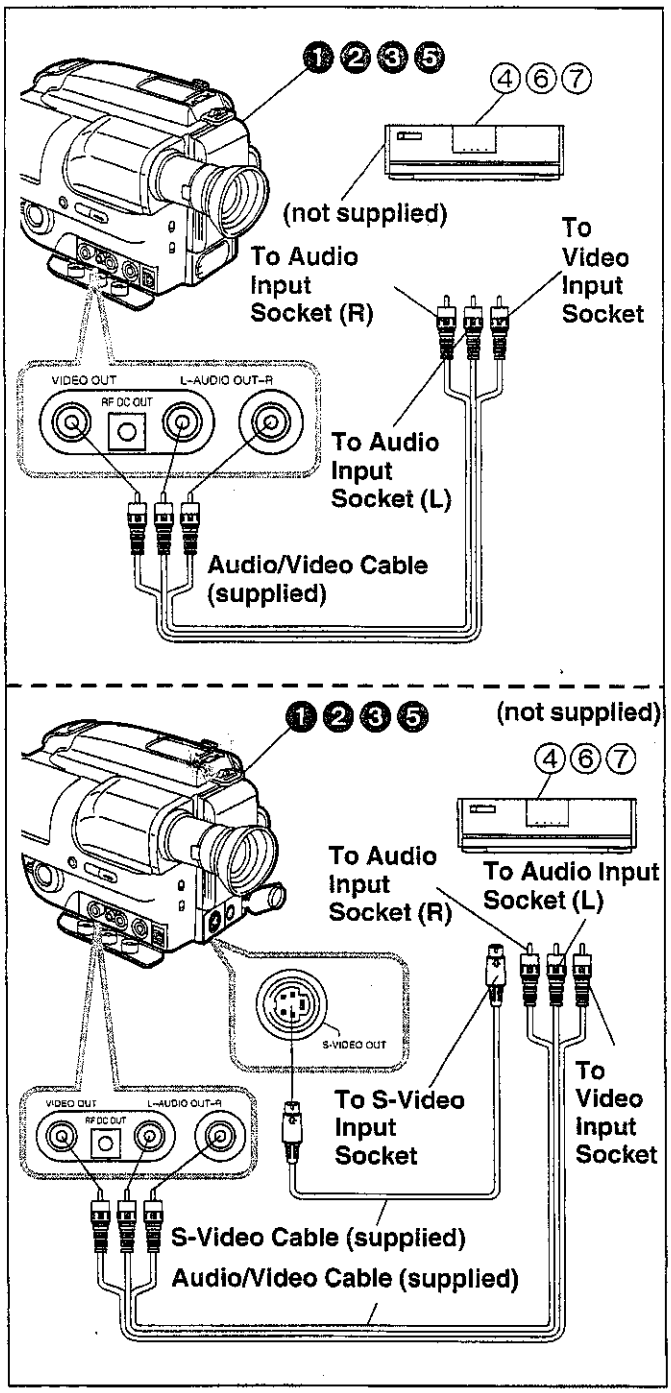
Notes:

1. The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
2. Do not start the car engine while the Movie Camera is being powered by the car battery.
3. If the voltage drops suddenly e.g. because the car air-conditioner is turned on, the Movie Camera is automatically turned off to protect it. Wait about 10 seconds before turning it on again.
4. Some cars, RVs and campervans use 24 V. Please confirm with vendor that your vehicle uses 12 V before using the Car Battery Cord. If used on 24 V, damage may occur and is not covered by the warranty.

1 Start the engine and then plug the Car Battery Cord into the Cigarette Lighter Socket.

2 Connect the other end of the cord to the [DC IN] Socket on the Movie Camera.

Editing a Previously Recorded Tape



Connect the Movie Camera to the VTR using the Supplied Audio/Video Cable or S-Video Cable.

■ Operations

Playback Unit (Movie Camera): ❶ ❷ ❸ ❺

- This operation can also be performed with the Remote Controller.

Recording Unit (VTR): ④ ⑥ ⑦

❶ Insert the recorded video cassette for playback into the Movie Camera.

❷ Play back the tape and locate the end of the scene that you want to dub, and note the tape counter position.

❸ Rewind the tape and locate the beginning of the scene that you want to dub.

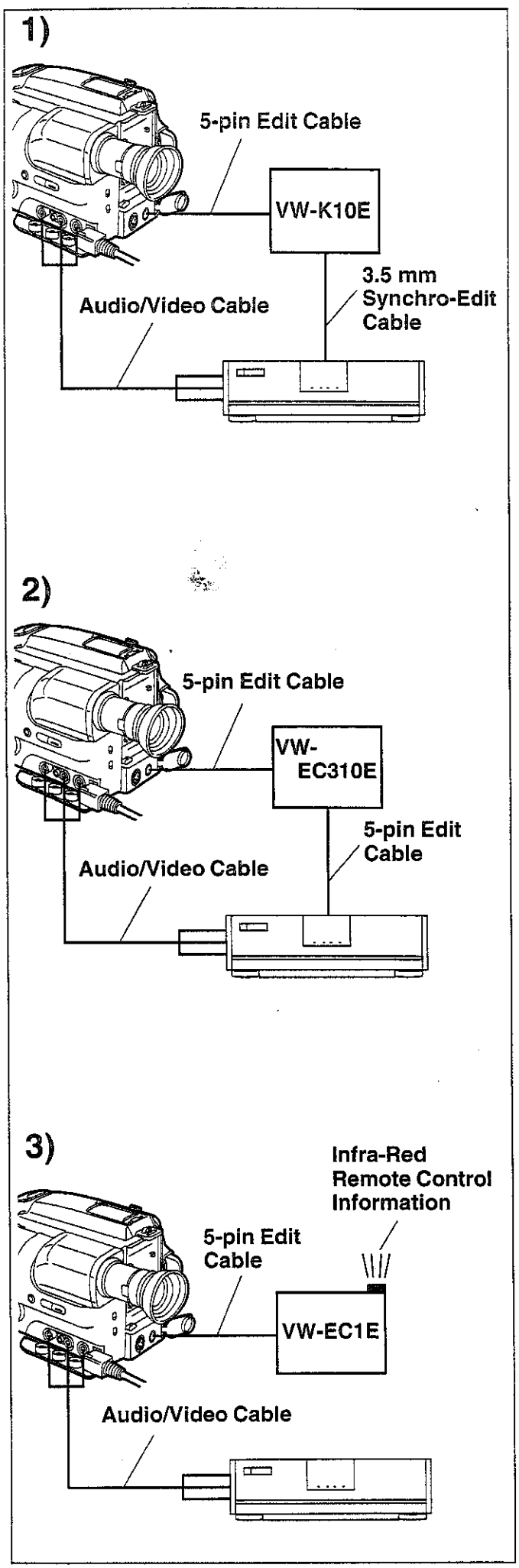
④ Insert the video cassette for recording into the VTR and put it in the Recording Pause Mode. Also read the Operating Instructions of the VTR. The picture quality deteriorates slightly in the dubbing process, however, this can be minimized by selecting the standard recording speed (SP Mode) on the VTR.

❺ Start the playback.

⑥ Press the Pause/Still Button to start recording.

⑦ As soon as the Tape Counter Indication on the Movie Camera reaches the position noted in step ❷:
Press the Pause/Still Button to put the VTR in the recording pause mode, thus finishing the dubbing.

❽ For all additional scenes that you want to dub, follow the above steps ❷ to ⑦.

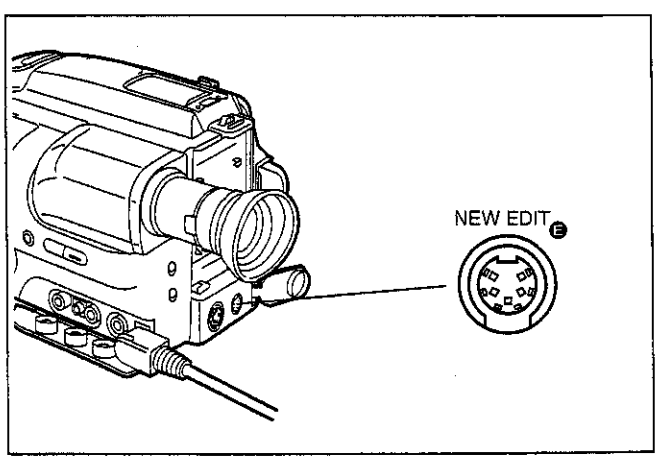


■ [EDIT] Socket

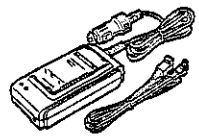
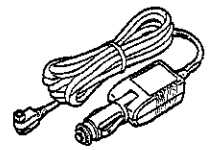
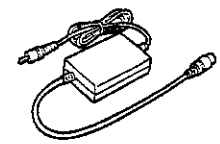
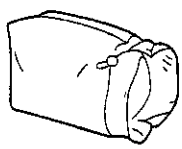
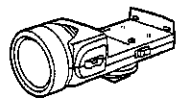
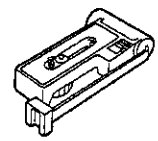
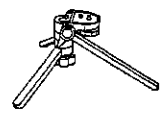
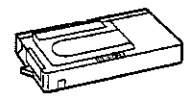
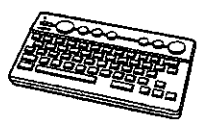
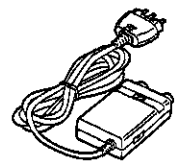
By connecting a Panasonic Editing Controller (optional) to this socket as well as to a Panasonic VTR equipped with Edit Socket, highly precise and speedy editing becomes possible.
The following types of Editing Controller can be used with this Movie Camera.

1) Connecting the Movie Camera to a Panasonic VTR equipped with synchro-edit socket (3.5 mm stereo jack) as the recording unit, using the 5-pin Synchro Cord VW-K10E (optional).
   - This is a single event edit controlling system. Therefore, the user needs to know the start and end points of the scene to be edited and needs to start and stop the editing manually.
2) Connecting the Movie Camera to a Panasonic VTR equipped with 5-pin edit socket as the recording unit, using the Editing Controller VW-EC310E (optional).
   - This Editing Controller can be programmed for automatic editing of up to 8 scenes.
   - When using this Editing Controller, be sure to edit with the "Standard-Speed Mode".
3) Connecting the Movie Camera to any brand of VTR equipped with Infra-Red Remote Controller as the recording unit, using the Editing Controller VW-EC1E (optional).
   - This Editing Controller can be programmed for automatic editing of up to 4 scenes.

Note:
The full instructions as written in the Operating Instructions of the Editing Controllers and the 5-pin Synchro Cord must be followed or the edit function may not operate correctly.
This may not be a fault of the Movie Camera.



Optional Accessories

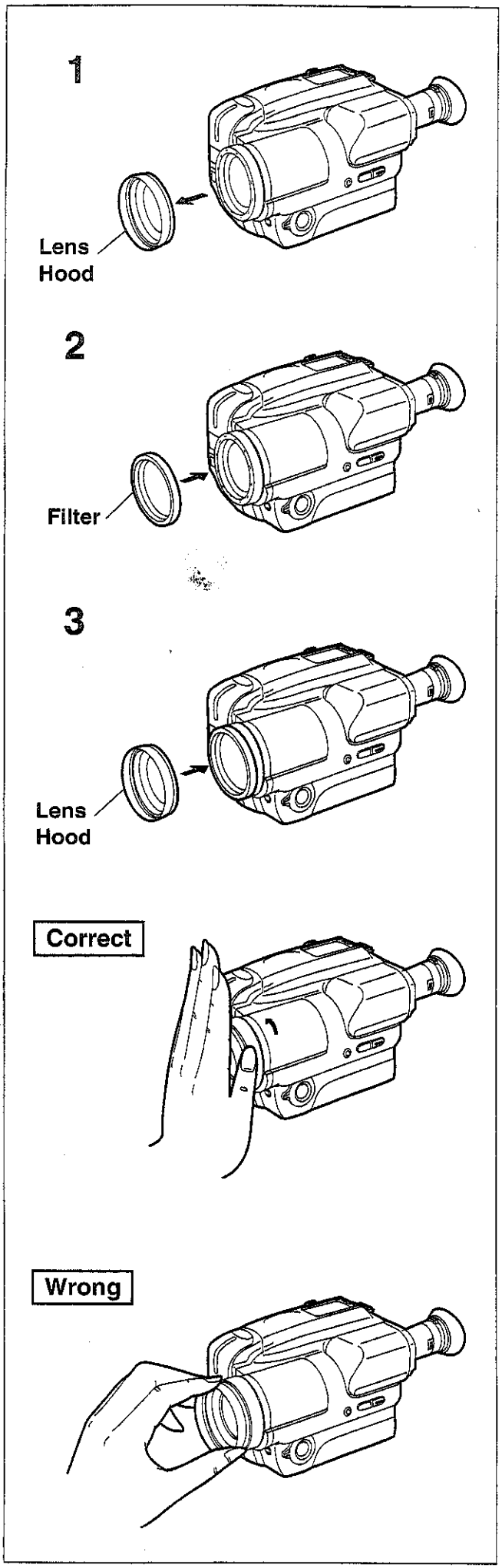
Battery Pack VW-VBS10E VW-VBH10E 	Battery Pack VW-VBS20E VW-VBH20E 	Car Battery Charger VW-KBC2E 	Car Battery Cord VW-ACC2E 	5-Pin Synchro Cord VW-K10E 
System Case VW-SHCS5E 	Soft Cover VW-SCS9E 	Video DC Light VZ-LDCS13E  The Shoe Adaptor (VW-SK9E; optional) is necessary.	Shoe Adaptor VW-SK9E 	Filter Kit VW-LF43E
Standard Tripod VZ-CT55E 	Deluxe Tripod VZ-CT75E 	Table Tripod VZ-CTT1E 	Cassette Adaptor VW-TCA7E 	Editing Controller VW-EC310E
Editing Controller VW-EC1E 	Video Titler VW-VT1A 	RF Adaptor VW-RF7E 		

Notes:

- Consult your dealer for details of other accessories not listed here.
- Some of these accessories may not be available in Australia. Please check with your retailer.

■ Charging Time and Maximum Time for Continuous Recording

Battery Pack No.	Charging Time	Max. Continuous Recording Time
VW-VBS10E	Approx. 65 min.	Approx. 40 min.
VW-VBS20E	Approx. 130 min.	Approx. 80 min.
VW-VBH10E	Approx. 80 min.	Approx. 50 min.
VW-VBH20E	Approx. 160 min.	Approx. 100 min.



■ Attaching a Filter (optional)

Before attaching an optional filter, first remove the Lens Hood from the Movie Camera.

1 **Remove the Lens Hood.**

2 **Attach the filter.**

3 **Attach the Lens Hood again.**

Notes:

- To remove the Lens Hood, press with the palm of your hand against it and turn in the direction of the arrow.
- When zooming toward wide-angle and using the Super Image Stabilizer Function while an ND Filter is attached to the Lens, the four corners of the picture may become black.

•Filter Kit (VW-LF43E)

The Filter Kit (VW-LF43E) contains and ND Filter and an MC Protector.

The ND Filter is recommended for recording in extremely bright places, e.g. on a beach or ski slope.

It prevents the picture from becoming whitish, yet without changing the colours. (When recording with the ND Filter attached, the Manual White Balance Adjustment Mode should be used, since the Auto White Balance Adjustment Mode would not work precisely.)

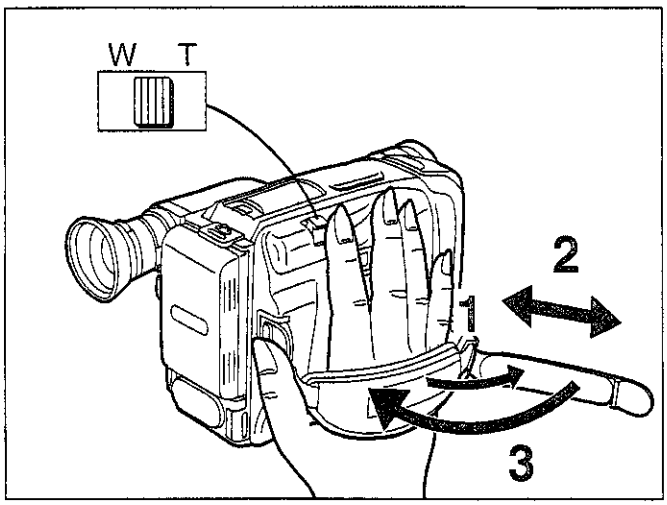
The MC Protector is used for protecting the lens and it can be used for virtually any kind of recording.

•Video DC Light (VZ-LDCS13E)

This Video DC Light is recommended for recording in a dark room as well as for recording photographs and pictures with the Macro Close-up function (p. 17).

To attach the Video DC Light (VZ-LDCS13E) to the Movie Camera, the Shoe Adaptor (VW-SK9E) is necessary.

Adjusting the Length of the Grip Belt



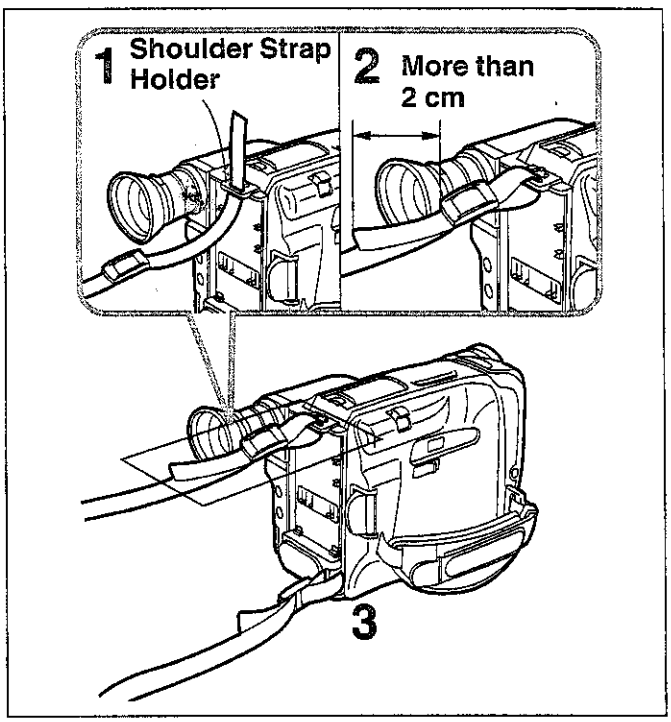
Adjust the Grip Belt so that you can press the Recording Start/Stop Button with the thumb, and the [W • T] Zoom Lever with the index finger.

1 **Unfasten the velcro tape closure.**

2 **Adjust the length to the size of your hand.**

3 **Fasten the velcro tape closure.**

Attaching the Shoulder Strap

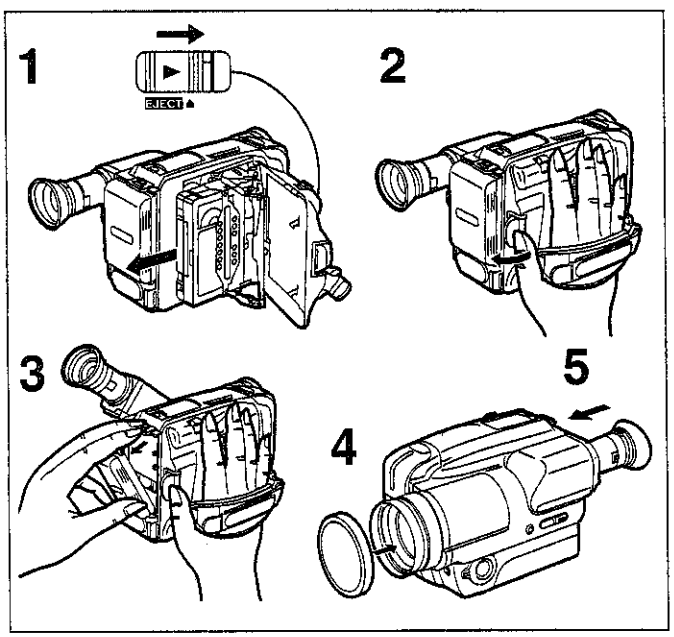


1 **Pull the end of the Shoulder Strap through the Shoulder Strap Holder.**

2 **Securely attach the end of the Shoulder Strap. (More than 2 cm)**

3 **Attach the other end of the Strap in the same way.**

Storage



1 **Slide the [EJECT ⏏] Lever and remove the video cassette.**

2 **Turn the [POWER] ON/OFF Switch in. (The Movie Camera is switched off.)**

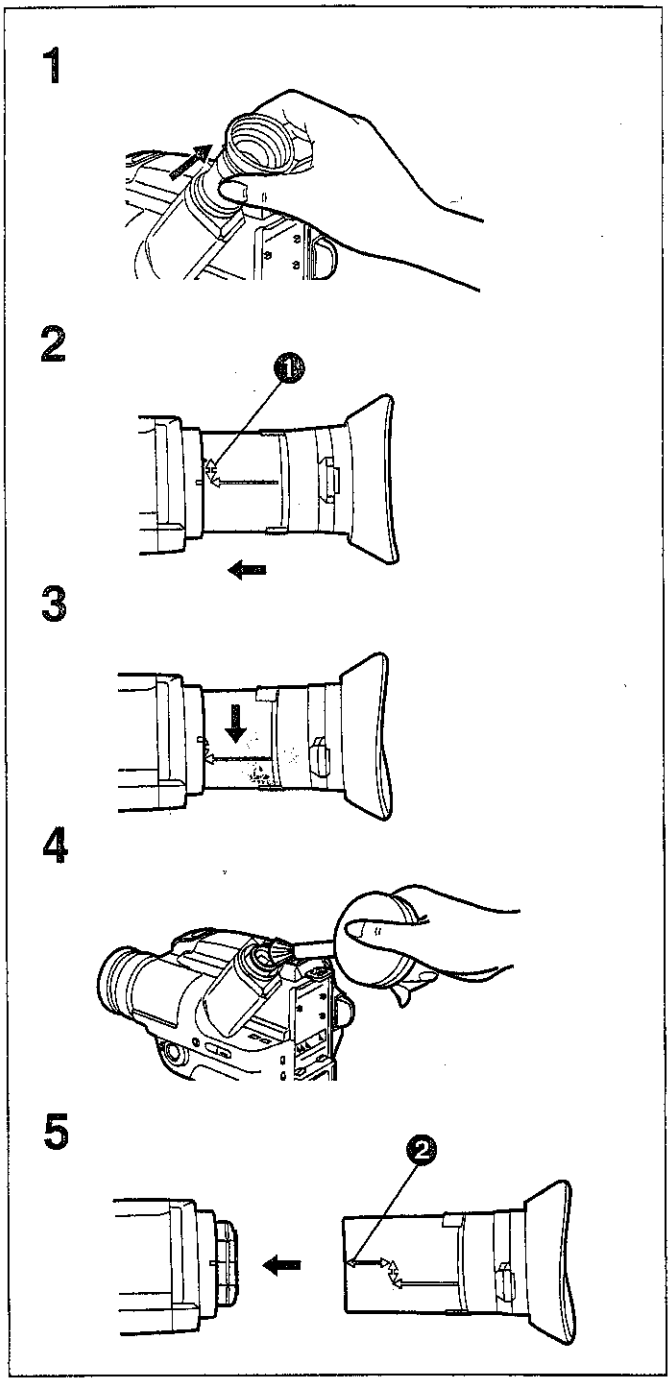
3 **Slide the [BATTERY EJECT] Lever and remove the Battery Pack.**

4 **Attach the Lens Cap.**

5 **Retract the Viewfinder.**

Note:
Remove the Battery Pack from the Movie Camera after use and keep it in a cool place. If the Battery Pack remains attached to the Movie Camera, a small amount of current flows to the Movie Camera, even if the [POWER] ON/OFF Switch is turned in, and this reduces the charge of the Battery Pack.

Cleaning the Viewfinder



1 Grasp the projections on both sides of the Viewfinder and fully extend it.

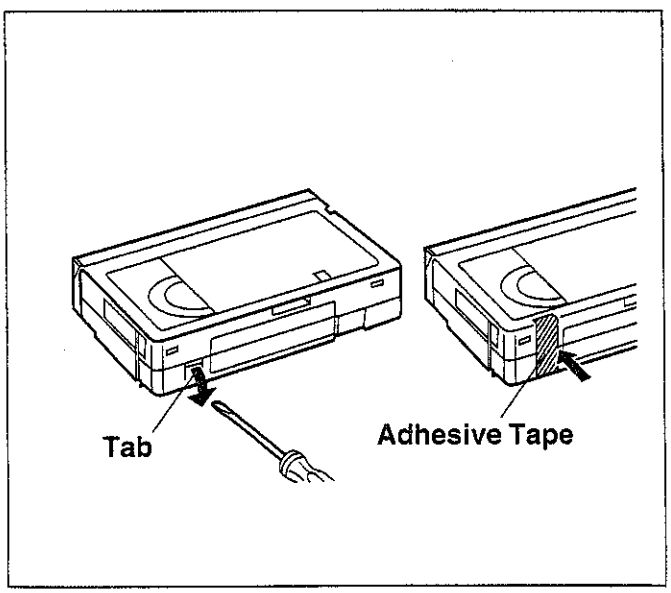
2 Push the Viewfinder back in about 3 mm to the arrow ❶.

3 Turn the Viewfinder counterclockwise until it stops, and then pull it off.

4 Remove dust with a blower brush.

5 To re-attach the Viewfinder, align it as shown in the illustration, slip it on as far as the arrow ❷ and then turn it clockwise.

Preventing Accidental Erasure of Recordings



When recording on a previously recorded tape, the previously recorded contents will be erased and replaced by the new recording. An important recording can be protected against accidental erasure by breaking off the tab. If the tab is removed, recording on this Video Cassette is no longer possible.

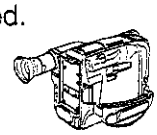
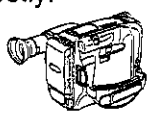
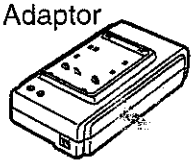
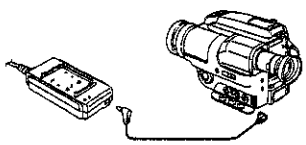
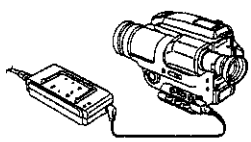
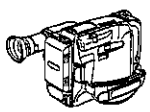
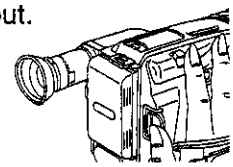
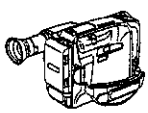
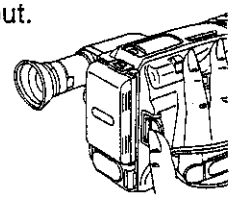
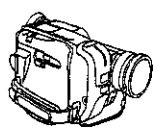
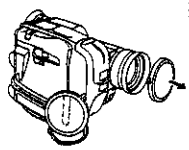
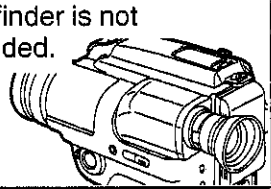
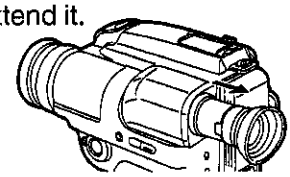
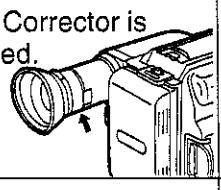
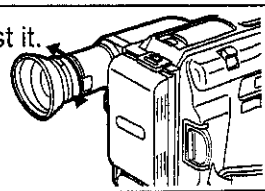
■ To protect important recordings against accidental erasure:

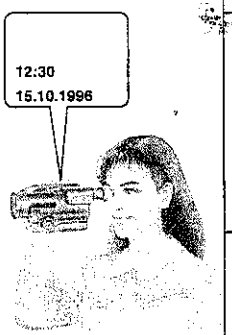
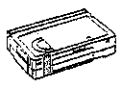
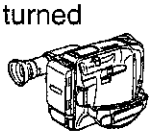
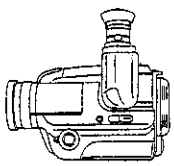
Break off the tab with a screwdriver in the direction of the arrow.

■ Recording onto a Video Cassette with a Missing safety tab:

Cover the hole firmly with two layers of Adhesive Tape.

Before Requesting Service

Item	Symptom	Cause	Action	Reference page
Power — Using the Battery Pack	● Movie Camera does not turn on.	● Not attached. 	● Attach it correctly. 	10
		● Not charged.	● Charge it.	10
	● Movie Camera turns off too soon.	● Exhausted.	● Use a fully charge one.	10
		● Recording was paused for more than 6 minutes.	● Turn the [POWER] ON/OFF Switch in to turn off the Movie Camera, and then turn it out again to turn on the Movie Camera.	17
Using the AC Adaptor 	● Movie Camera does not turn on.	● Not connected. 	● Connect it correctly. 	8
Using any of the power sources	● Movie Camera does not turn on.	● [POWER] ON/OFF Switch is not turned out. 	● Turn it out. 	12
	● Movie Camera turns off too soon.	● Condensation has formed inside.	● Wait several hours.	56
Recording	● No picture in the Viewfinder.	● [POWER] ON/OFF Switch is not turned out. 	● Turn it out. 	12
		● Lens Cap is attached. 	● Remove it. 	12
		● Power Save Function has been activated.	● Hold the Movie Camera in horizontal position.	44
	● Indications in the Viewfinder are not clear.	● Viewfinder is not extended. 	● Extend it. 	12
		● Eyepiece Corrector is not adjusted. 	● Adjust it. 	12
		● Viewfinder is dirty.	● Clean it.	53

Item		Symptom	Cause	Action	Reference page
Recording		●Recording cannot be started.	●The erasure prevention tab of the inserted cassette is broken off.	●Cover the tab hole with adhesive tape. 	53
			●No cassette is inserted.	●Insert a cassette with intact erasure prevention tab.	12
			●Tape has reached its end.	●Insert a new one.	12
		●Some noise from the zoom operation is picked up.	●The surroundings are very quiet.	●Use an external microphone.	5
		●Date and time cannot be recorded.	●Date and time are not set.	●Set the date and time.	14
		●Date and time are not displayed in the Viewfinder.	●[DATE/TIME] Button was not pressed.	●Press the [DATE/TIME] Button.	14
			●Built-in Lithium Battery is exhausted.	●Recharge the Built-in Lithium Battery.	15
		●"U11/✪" appears in the Viewfinder.	●The video heads are dirty.	●Return the Movie Camera to a qualified service personnel.	56
Playback (picture)		●No picture.	●[POWER] ON/OFF Switch is not turned out. 	●Turn the switch out and press the [VTR/CAMERA] Button so that the "VTR" Indication Lamp lights up.	24
			●Not connected or incorrectly connected to TV set.	●Connect correctly.	8
			●Wrong channel is selected on TV set.	●Select the correct channel.	—
		●Picture is distorted or not in colour.	●Tracking is not adjusted.	●Adjust the tracking.	43
		●Picture contains noise bars.	●Cue, Review or Still Playback is activated.	●It is not a malfunction.	25
Others		●Operation with the Remote Controller is not possible.	●Remote Controller's battery is exhausted.	●Replace it with a new one (CR2025).	6
			●Battery is not inserted correctly.	●Insert the battery with its poles correctly aligned.	6

Cautions

In case of abnormal operation of this unit (e.g. if it emits smoke or some unusual smell), immediately stop the operation and consult qualified service personnel.

■ Cautions for Use of the Movie Camera

- When a thunderstorm approaches, stop using it. (If the AC Adaptor is being used, disconnect it from the AC Mains Socket.)
- Do not aim the Lens at the sun. (This could damage internal parts of the Movie Camera.)
- Do not use it in the water or in places where water or some other liquid could splash on it. (If it is accidentally dropped into water while the AC Adaptor is being used, disconnect it from the AC Mains Socket.)
- Do not use it with the cassette compartment facing down. (This could cause uneven winding of the tape.)
- Do not insert or remove the video cassette in dusty places.
- Do not use the Viewfinder as a carrying handle when transporting the Movie Camera.
- Do not disassemble or reconstruct it.
- Do not subject it to strong vibrations or shocks. Handle it with care to prevent accidentally dropping it.
- Do not insert any foreign objects into the Movie Camera nor spill water into it.
- Do not use it in areas with strong electric fields. (This could negatively influence the picture quality.)
- Do not operate it near a TV set or a radio. (This could distort the picture and sound reception.)
- Do not use it in places with steam or oily smoke.
- When unplugging the mains cable, pull it by the plug, not by the cable.

■ Cautions for Cleaning the Movie Camera

- Do not use benzine, thinner or other chemicals for cleaning, because they could change the colour and damage the surface of the camera body.
- When using a chemically treated cloth for cleaning, carefully follow the instructions for its use.
- Wipe the Movie Camera with a clean, dry cloth. Never use cleaning fluid or other chemicals.
- Clean the lens only with a blower brush (used for photo cameras) or special lens cleaning tissue (used for glasses and cameras).

■ Cautions for Storage

- Do not store this Movie Camera in the following places.
  Places exposed to direct sunlight.
  Places with high temperature and high humidity (e.g. in a closed car or in a bathroom).
  Near heaters.
- Do not leave it in direct contact with rubber or plastic products for a long time.
- Keep it out of reach of children.

■ Cautions for Transport

- When not actually recording, carry it in a specially designed Carrying Case.
- Keep the packing materials. When transporting it in the future, pack it in the same way as you purchased it.

■ Cautions for the Video Head Clogging

When the "U11/⊠" flashes, consult qualified service personnel.
It is not recommended to use head cleaning tapes in this Movie Camera, because they may cause damage or the tape may become stuck. The removal of head cleaning tape is not covered by warranty.

Condensation

If Condensation Has Formed Inside the Movie Camera, Recording is Not Possible.

■ Symptoms of Condensation

- If the following symptoms occur, condensation has formed inside the Movie Camera.
  - ❶ The Condensation Indication in the Viewfinder flashes.
    (After this indication flashes for a few seconds, the Movie Camera will automatically turn itself off again.)
  - ❷ When turning on the Movie Camera, it turns itself off.
    (However, the Movie Camera also turns itself off when the Battery Pack is exhausted.)

■ How to Remedy Condensation

When condensation has formed inside the Movie Camera, the "U10/[▲]" Indication appears in the Viewfinder. In this case, remedy as follows:

1. Take out the Video Cassette and leave the Cassette Compartment Cover open.
2. Keep the Battery Pack attached or the AC Adaptor connected to the Movie Camera, and turn in the [POWER] Switch to turn the Movie Camera off.
3. Wait a few hours before operating the Movie Camera again.
   (The actual time depends on the surrounding conditions.)
4. Turn on the Movie Camera.
5. Confirm that the Condensation Indication is not displayed any more.
6. For added safety, wait about 1 more hour.

■ Remarks about Condensation

- Condensation can form if the Movie Camera is suddenly brought from cold surroundings to a place where it is hot or humid.
- Since condensation forms gradually, there may already be some condensation inside the Movie Camera even before the Condensation Indication begins to flash.
- In an extremely cold place, condensation may freeze and turn into frost. As the Movie Camera cannot detect frost, the Condensation Indication does not appear until the frost melts.

■ Precautions against Condensation

When moving it from a very cold place to a very warm place, keep it in a tightly closed plastic bag or similar to prevent condensation from forming.

Index

A

AC Adaptor (p. 8, 10)
AC Mains Socket (p. 9, 11)
[AE] Selector (p. 17, 28, 32, 39)
Anti-Ground-Recording Function (p. 44)
[AUDIO OUT L/R] Sockets (p. 8, 48)
Auto Focus Mode (p. 28)
Automatic White Balance Adjustment (p. 32)
Auto Mode (p. 17)
Auto Power Save Function (p. 44)

B

[BATTERY EJECT] Lever (p. 11)
Battery Pack (p. 10)
Before Requesting Service (p. 54)
Built-in Lithium Battery (p. 15)

C

Camera Search Function (p. 42)
"CAMERA" Indication Lamp (p. 16)
Car Battery Cord (p. 47)
Cassette Adaptor (p. 26)
"CHARGE" Lamp (p. 10)
"CHK" Indication (p. 42, 45)
Condensation (p. 57)
Cue Playback (p. 24)

D

[DATE/TIME] Button (p. 14)
Date/Time Setting (p. 14)
[DC IN] Socket (p. 8, 47)

E

[EJECT ▲] Lever (p. 12)
Error Code (p. 21)
Eyecup (p. 53)
Eyepiece Corrector Ring (p. 13)

F

[FADE] Button (p. 40)
FF (Fast-Forward) (p. 24)
[FOCUS] Button (p. 28)
Focus Ring (p. 29)

G

Grip Belt (p. 52)

H

Head Clogging (p. 56)
Hi-Fi Mode (p. 23)

I

Index signals (p. 17)
[ITEM/PAUSE] Button (p. 25, 37)

L

Lens Cap (p. 12, 32, 52)
Low Light Mode (p. 38)

M

Manual Focus Mode (p. 28)
Manual White Balance Adjustment (p. 32)
Max. Recording Time with Battery Pack (p. 11, 50)
[MEMORY] Button (p. 18)
Menu Indication (p. 36)
[MENU/PLAY] Button (p. 25, 37)
[MIC] Socket (p. 5)

N

[NEW EDIT] Socket (p. 49)

O

Optional Accessories (p. 50)

P

Portrait Mode (p. 38)
[POWER] ON/OFF Switch (p. 12)
[POWER SAVE] Switch (p. 44)

R

Rec Check Mode (p. 42)
Recording Start/Stop Button (p. 16)
Remaining Tape Time (p. 18)
Remote Controller (p. 6)
Remote Control Receiver Window (p. 7)
[RESET] Button (p. 18, 19)
Review Playback (p. 24)
REW (Rewind) (p. 24)
[RF DC OUT] Socket (p. 4)

S

[SET/STOP] Button (p. 25, 37)
Shoulder Strap Holders (p. 52)
Sports Mode (p. 38)
Standard Accessories (p. 3)
Still Playback (p. 25)
Super Image Stabilizer Function (p. 36)
[S-VIDEO OUT] Socket (p. 9, 48)

T

Tape Counter (p. 18)
Tape Length (p. 18)
Tracking Adjustment (p. 42)
Tripod Receptacle (p. 5)

V

[VIDEO OUT] Socket (p. 8, 48)
Viewfinder (p. 20)
[VTR/CAMERA] Button (p. 24)
"VTR" Indication Lamp (p. 24)

W

Warning/Alarm Indications (p. 20)
[W.B] Button (p. 33)
White Balance Adjustment (p. 32)
White Balance Sensor (p. 32)
[W•T] Zoom Lever (p. 17)

Z

Zoom (p. 16)
Zoom magnification (p. 16)

Specifications

S-VHS-C Movie Camera

Information for your safety

Power Source:	4.8 V (Battery Pack) 6.0 V (AC Adaptor)
Power Consumption:	7.9 W (Battery Pack Operation)

- The rating plate is on the bottom side of the Movie Camera.

Video Recording System:	Rotary four heads, helical scanning system
Tape Speed:	23.39 mm/s
Tape Format:	S-VHS-C/VHS-C tape
Recording/Playback Time:	45 min. with NV-SEC45XD

VIDEO

Television System:	CCIR; 625 lines, 50 fields PAL colour signal
Modulation System:	Luminance; FM azimuth recording Colour signal; Converted subcarrier phase shift recording
Output Level:	VIDEO OUT (PHONO); 1.0 Vp-p, 75 ohm terminated S-Video Out; 1.0 Vp-p, 75 ohm terminated

AUDIO

Output Level/ Impedance:	AUDIO OUT (PHONO); −6 dBV (47 kohm loaded)/ less than 1 kohm
Input Sensitivity/ Impedance:	MIC IN (M3); −70 dBV/ 4.7 kohm or more unbalanced
Audio Track:	1 track (Normal-Monaural) 2 channels (Hi-Fi Sound-Stereo)
Image Sensor:	⅓-inch CCD Image Sensor
Lens:	14:1 wide-angle/Variable Speed Power Zoom Lens with Digital AI Auto Focus Focal Length; 3.9–54.6 mm F1.4 Auto Iris Filter Diameter; 43 mm
Viewfinder:	0.5-inch Electronic Viewfinder
Standard Illumination:	1,400 lux
Minimum Required Illumination:	1 Lux (Low Light Mode)
Video Horizontal Resolution:	S-VHS; More than 400 lines (S-VIDEO OUT) VHS; More than 250 lines
Signal-to-Noise Ratio:	Video; More than 43 dB Audio; More than 47 dB (Hi-Fi) More than 41 dB (Normal)
Audio Frequency Response:	Hi-Fi; 50–20,000 Hz Normal; 80–8,000 Hz
Operating Temperature:	0°C–40°C
Operating Humidity:	10%–80%
Weight:	Approx. 870 g (without Battery Pack)
Dimensions:	Approx. 117 (W)× 116 (H)×225 (D) mm

AC Adaptor

Information for your safety

Power Source:	AC 100–240 V, 50–60 Hz (Automatic voltage adjustment)
Power Consumption:	25 W
DC Output:	DC 6.0 V, 8.5 W (Movie Camera Operation) DC 4.8 V, 1.2 A (Battery Pack Charging)

- The rating plate is on the bottom side of the AC Adaptor

Weight:	Approx. 210 g (without AC Cable)
Dimensions:	Approx. 72 (W)×39 (H)× 143 (D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

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